A JOURNEY TO 21st CENTURY EDUCATION

This is how the world's most innovative schools work

Alfredo Hernando Calvo

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FUNDACIÓN TELEFÓNICA

Explore to Inspire to Transform

These three words summarise Fundación Telefónica's philosophy for education in the 21ST century. We "explore" in order to identify and analyse the most innovative trends in education, and to design and deploy education programmes. We seek to "inspire" because it is important to share the fruits of our explorations. We aim to share with teachers, schools, public administration, and the society at large. Mostly, we hope to promote debates, conferences and educational encounters so as to share new teaching strategies and best practices. We wish to "transform" by setting the example and actively participating in social projects aimed at improving conditions for the most vulnerable populations, as is Fundación Telefónica's mission.

As the digital world transforms our societies, education can receive its greatest impact. Teaching that seeks solely to transmit information is not suited to the needs of the 21ST century. Now more than ever, schools must introduce new working methods into the classroom so as to teach how best to extract relevant knowledge from the information that surrounds us, how to learn in collaboration with others, and how to develop new skills.

Throughout the world, several pioneers are currently paving the way for education's future. *A Journey to the 21ST Century Education* is an explorer's guide in which Alfredo Hernando helps us discover the newest paths taken in education. By focusing on the world's most innovative schools, we can understand new teaching methods that will be the key to the challenge of transforming education.

This book hopes not only to present, in a rigorous yet entertaining manner, the most innovative tendencies in education throughout the world, but also to encourage the reader to promote innovation him or herself by following 80 concrete steps. We are convinced that teachers and school administrators alike will be able to apply the strategies here explored in their own contexts, and that this book will be a valuable tool for the education sector. We are confident that this book will further promote the exciting process of transformation that education is undergoing today.

THE AUTHOR

Alfredo Hernando Calvo

Alfredo Hernando Calvo is a psychologist and academic. He brings together the two veins of his professional orientation in his passion for education innovation. Since 2013, he has been the director of the escuela21.org project. His participation in the project during the last two years has allowed him to understand and experience first hand the most innovative education techniques throughout the world. Thanks to this incredible experience, you currently hold in your hands a book that distils the best practices in education he came across on his trip and brings these invaluable experiences from some of the most remote places in the world straight into your classroom.

Alfredo is an explorer of the methodology of design thinking, gamification, the landscapes of learning, the adoption of technology in the classroom, and the management of innovation processes in education centres. With hundreds of hours of training and work with other academics, he has been editor in chief of Revista Educadores, advisor to the Pedagogical Innovation department of Escuelas Católicas (a Catholic school group in Spain), a teacher and a school counsellor. With a BA in psychology and an MA in Hispanic Philology, he is a frequent contributor to improvement and transformation programmes for education professionals and executives throughout Spain.

He currently participates in several international innovation projects with institutions such as Fundación Telefónica, Spain's Ministry of Education, and a project aimed at the participative building of housing in Vienna, gleis21.wien, with a strong social component that focuses on integrating refugees, social media communication, and environmentally friendly architecture.

He participates actively in social media, congresses, qualifications exams, and online education. He writes for a variety of publications, but above all, he continues to do research and share educational best practices online at escuela21.org.
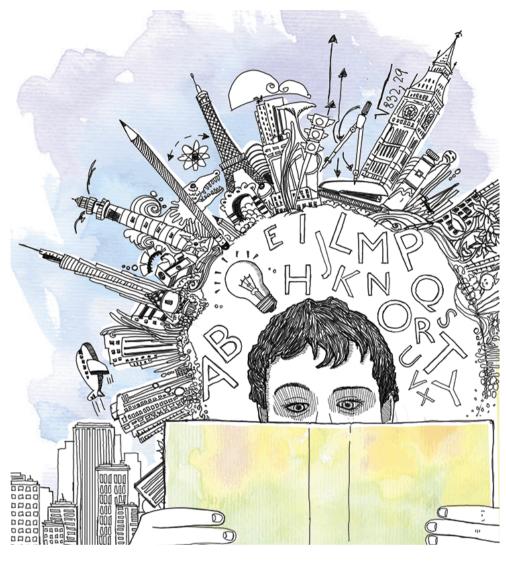
HOW TO READ THIS BOOK

This book was born out of a journey and is itself a journey. The way it must be read therefore depends on your condition as a reader, but also on your experience as a traveller.

If you want to go around the world, city by city, with a well-organised travel schedule, then you can simply read the book from beginning to end.

But if instead you prefer making short trips here and there as you jump from one spot on the globe to another, or if you have come to these pages in somewhat of a hurry searching for concrete advice, then I propose a different way of travelling.

This book is at once the diary of a long journey and the narration of a whole set of experiences. It is both theory and practice. It is as much a worksheet as it is a finished essay. You can now choose how to travel as a reader, but the one thing you must not forget is going beyond the book's mere words. Take the initiative. It is the only way to embrace school21's spirit.

And above all, enjoy yourself. Journeys, like life, are short and come to an end. You are full of talent and possibilities abound. There is a place that awaits your encounter. Don't let the journey of your life catch you without participating in the adventure of the century: your own transformation in school21.

HOW TO READ THIS BOOK

Chapters

Chapter Sections

Videos and Interactive Content

This symbol represents an **IDEA**. You will get to experience first hand the reasons at the heart of each school21 transformation. You will come to understand the research, evidence and reasons behind each decision taken. Many of these are rather surprising, and they uncover great mysteries surrounding our learning processes and the enormous wealth we humans have. You can learn so much about yourself and about others around you.

This symbol represents a **METHOD**. You will discover the tools that school21 educators employ in order to bring about genuine change in their day to day activities. Here you will understand how models are applied. What is more, you will have access to graphs and specific suggestions to take the initiative yourself and bring about change in your or your children's school. This journey, along with its easy-to-follow instructions, will allow you to build your own school21. Let's get to it!

This symbol/colour represents a **JOURNEY**. You will travel to different cities throughout the world, but above all you will experience what a school21 has to offer, from its classrooms, its day to day activities, and the way in which teachers and students interact. This is a journey to the heart of school21 institutions all over the world. You will feel like you were there yourself!

Finally, this symbol represents **ACTION**. You will find proposals of specific actions that you can take at any time. Small, simple, direct actions like the ones here highlighted will allow you to discover your identity as a learner or as a 21ST century school. Some of these actions are directed at teachers and schools, but many others are designed for anyone to take. Reading and travelling without experimenting is half the reading and half the journey. Throw yourself into the adventure after reading.

This is a PDF document, and in order to get the most out of it, it is best to use Adobe Acrobat Reader. This will allow you to benefit from integrated navigation tools.

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INTRODUCTION

Let's get moving. It is early and the sun has not yet decided to come out. I am taking a stroll around the outskirts of Bogotá. Drivers honk horns in traffic. Amongst them, school children wearing their backpacks dance around cars and exhaust fumes as they play tag. They smile, oblivious to everything that surrounds them. They are happily off to school.

The outskirts of Bogotá are home to the city's poorest families. Nearly half of the teenagers from these slums drop out of high school. This is where I met María, a smiling 12-year-old girl with an incessant curiosity, who did not stop asking me questions through lunch.

María wanted more than anything in the world to go to Spain and visit Madrid. She wanted to travel on a plane –which she said would be "cool"–, visit a friend in a small town outside Barcelona, visit one of those soccer stadiums that they show on TV, speak Spanish in Europe, try a Spanish omelette, visit an art museum, and so much

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The world is full of schools where teachers and students behave differently, where things have a different tone

more. Ultimately, however, after providing a long list of reasons why she wanted to go, she simply changed the subject. "And what are you doing in Colombia?," she asked me. "Well, I came to visit your school," I told her. "Oh, of course!" "What do you mean, 'of course'?," I replied, a bit surprised. "You have all these reasons to visit Spain, but for me, visiting your school is more than enough of a reason to come to Colombia!" "Well, of course," she said with a grin, "my school is just the best!" And she was quite right.

María's school has as many resources as any other in her neighbourhood, which are not very much. However, everything that takes place within its walls is completely different from what one might expect to happen in a traditional school. This is how it has managed to ensure that more than 90% of its students finish their studies successfully.

María's was once a school, but it is no longer so. Nowadays, it is a personalised learning community, a school21. When a school acts, changes, grows and develops with an eye on the present, on research and on local and global realities, it thereby discovers its school21 identity. The difference between a school and a school21 has to do learning to live for another life, discovering another world, and creating a new narrative of ourselves. María's school21 is one of the best in the world.

I am sure that you recall your own school. If you take a second to think about it, you will surely be

able to reminisce over teachers, tests, emotions, team projects, classmates... At school we learn to live and we discover the world, but we also transform it and we recount our identity. For better or for worse, school is an institution that leaves no one untouched. This is why children either love it or hate it. There is no middle ground.

I recall my first day at school like it was yesterday. I absolutely hated it. Years later I studied psychology and I have spent the last few years working with all sorts of schools throughout Spain. My worst nightmare has become my dream and passion. That very specific link that I had to school, always going back and forth between love and hatred, between eager excitement and sincere boredom, just like a child, has made education innovation one of my passions.

One thing that is certainly true is that from my first day in a classroom until today, I have visited a whole lot of schools. But as I participated in new projects, read more books, and discovered new successful experiences, it always seemed to me that something was not quite right. These schools looked nothing like the school where I had studied, but they looked nothing like the schools that I worked with either. It is not that they had overly modern programmes or that they employed state of the art technology. They were simply different.

When I talked about them to my friends, they would stare at me in disbelief. Later, we would imagine

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I got to know so many different schools in this incredible journey, but I also discovered many schools21

what it would have been like to study at such a school. We all agreed that different schools would lead to different lives. I myself, from time to time, would dream about travelling and visiting one of them... That is why one day I just decided to renew my passport, pack my bags and embark on a journey.

In 2013, I spent nine months visiting innovative educational experiences throughout the world. I had the chance to visit schools in Uruguay, Argentina, Colombia, the United States, Australia, Denmark, Austria, Portugal, Japan, and South Korea. I had the opportunity to talk to their teachers, and share their projects on a day-to-day basis. Every school that I visited would point me to new destinations on the map, to experiences from so many other schools in Brazil, Chile, Italy, the United Kingdom, China, Singapore, New Zealand, India, and perhaps some other place that I might be leaving out...

I got to know so many different schools in this incredible journey, but I also discovered many schools21.

A school21 is not a school. A school21 is a school for the 21ST century. At first glance, one might think that this distinction changes nothing. In fact, all schools today should be 21ST century schools. But the truth of the matter is that they are not. They exist in the 21ST century, but they do not live the 21ST century. Their institutional clock has stopped.

In a school21, students learn with the movement of the body because it is a way of manifesting our intelligence. It is a school where several spaces are available: couch, reflection, intimacy, studying, dialogue, cloud... It is also a school where each and every student has his or her own structure, but where they all share in the same project. It is a school where teachers plan courses together, where they dialogue with one another about their experiences in the classroom thus work in collaboration. It is a school where students self evaluate and where they choose what to do with their time when they come in the door every morning, every evening, or whenever they choose to. It is a school with original and creative projects that are born out of every child's own heart and that are directly related to our future's great challenges. It is a school dedicated to understanding and creativity, where students learn the language of thought, but also of emotions.

The good news is that this is not an isolated case. The world is full of schools where teachers and students behave differently, where the tone of things is a bit different, where schedules change, and where classrooms and hallways are the scene of completely new performances. These are schools that grow in order to deliver better results. These are schools that become school21 institutions.

But the most important thing is that in this journey I discovered a phenomenon that filled me with hope. Amongst the clutter of such diverse experiences there is a common denominator. The growth of these schools always goes through similar steps. What

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This book contains the keys to success taken from a wide sample of schools that successfully educate in the 21ST century

happens at María's school21 in Bogotá is very much akin to what goes on in other schools in Barcelona, Sydney, New York, San Francisco, Manchester, Sao Paulo, Copenhagen, Buenos Aires... These schools are all paving the way for a new institutional model. Different experiences scattered the world over are bearing witness to similar transformations.

The success of María's school is repeated the world over. These schools have created a new paradigm; a new way to be a school. They are different from many others, but when compared with each other, they all resemble one another. At the end of the day, it does not seem quite right to call them schools. They are something else, and they need a new name! This is why I decided to call them school21.

The world had never changed as quickly as it does nowadays. Advancements in technology and scientific knowledge, in neuroscience, in psychological and pedagogical theories... all of these lead change and transformation in every school21. A school that incorporates research advancements discovers a new identity; it changes, it grows, it gets developed and transformed. Students of the present inherit the great challenges that generations of the past have been unable to solve. Our greatest hope is to create a new ideal for schools that will be able to educate on a new level of human existence.

This book is a tribute to the courage of all these schools21. It is not a book about education systems throughout the world, but rather about the specific schools I visited. This is why it contains the keys to success taken from a wide sample of schools that successfully educate in the 21ST century.

1. THE SECRET OF THE SUPER-SCHOOL

- ➲ Let's travel to Bangladesh, India and New York.

- ➲ We will discover why schools change, and where they look to for inspiration and growth, innovation and improvement.

- ➲ We will understand where and how to apply these changes to our school.

- ➲ We will create our own innovation project in order to become a school21.

JOURNEY
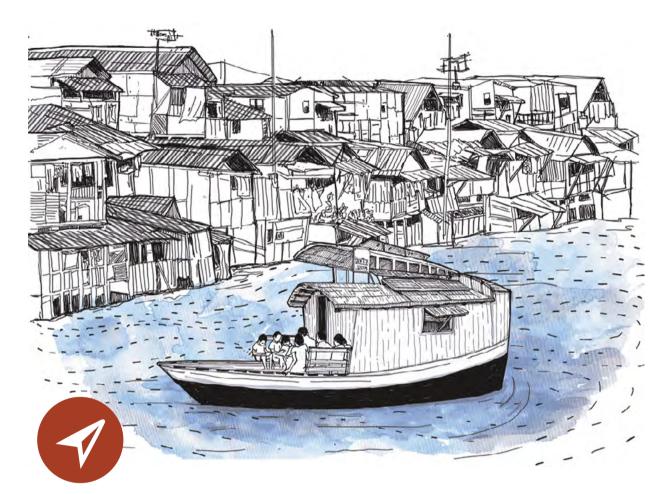
The country where tigers learn how to fish

On the country's southern edge, along the bay of Bengal, survival has become and act of heroism for both tigers and children alike. Frequent and intense storms have made floods commonplace. Speed, strength and elegance are of little use to the Bengal tiger when water reaches its whiskers. What was once a sporadic problem has only been accentuated by global warming. The mangrove has become a peculiar Atlantis.

The Bengal Atlantis rises above the labyrinth created by the mangrove roots. Every year it re-emerges after each flood. It is part of the routine of both children and tigers.

The striking orange colour of its skin, and the beauty of the species, do not work in its favour. Furtive tiger hunting has been on the rise in recent years, so the children have little to fear; however, it is the felines who are fighting to survive here. There are Bengali who affirm having seen the tigers swimming and fishing with their jaws. For Abul Hasanat Mohammed, seeing a tiger dive into the mangrove has become commonplace. After all, tigers are as sly as he is.

> Shidhulai has created an educational model that brings meaning to the lives of 80,000 students in Bangladesh

Abul Hasanat knows about tigers, children... and resourcefulness. He tends to steer clear of the former, while the latter he carries aboard his barge, and about his resourcefulness... well, there is no better proof than his boat. The Tropic of Cancer divides Bangladesh in two, and Abul frequently crosses from one side to the other.

Abul Hasanat knows what it means to grow up in a country where more than 58 rivers empty into the ocean. Most of the riverbeds have been lost due to the frequent rains. Flowing rivers that create floods. Floods that create disasters. Disasters that leave millions of people without a home, and without resources. Furthermore, Bangladesh is the world's ninth most populated country with more than 154 million people in an area of less than 150,000 square kilometres. To put this into perspective, just imagine four times the population of Spain cluttered in

a quarter of its territory; somewhat like cramming all the world's Russians into an area the size of Castile and León, plus Aragón. Thus, the Bengali Atlantis is no mere exaggeration. In the end, a civilization is being washed away by the rain year after year.

Abul's long and narrow barge is propelled by stuttering engine, producing a rather rhythmic melody of combustion. As with children's homes, the main cabin is built out of bulrushes. On its roof, however, instead of sails a garden of solar panels has been planted. The panels give the barge an air of modernity, but above all, they supply the machinery inside. A computer and a few bulbs take up most of the load. Seats and chairs are organised in rows, instilling an orderly ambiance. Yet, no one is guarding the entrance, which is free of charge. Right before the cabin, a blackboard filled with numbers and letters imposes its presence.

A school-boat

The floods are not solely an inconvenience for tigers. Thousands of families spread over the delta lack the basic resources required to live with dignity. In this region, girls are not authorised to walk alone. Thus, even if there were a single school and a building that lasted for more than a year without flooding, they wouldn't be able to attend. For Abul Hasanat, it was clear: " If children can't go to school due to the constant flooding and deterioration of transport infrastructures, the school must come to them".

This is Shidhulai's philosophy, the organisation behind the educational model that brings meaning to the life of 80,000 students in Bangladesh. A clever project that has transformed weaknesses and environmental setbacks into an opportunity. It has created school-boats, and in Numa, it has used rivers as primary communication channels.

Abul's school-boat is not the only one; a large fleet has been growing. In 2007 the United Nations recognised this significant achievement. Shidhulai

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> Students from all ages have not only learned to read and write, but also to cook and even build solar panels, thanks to the Barefoot initiative

has not only been recognised for their educational model bringing schooling to adults and children of all ages, but also for its solar panel gardens, which have turned boats into buoyant and eco-friendly energy providers. School-boats are energy stations making dozens of stops during each journey. Every time they drop anchor they provide electric power to LED lamps for night lighting, tools for agriculture and other labours, and of course, they provide school time.

Shidhulai barges have invented a new school model, one which adapts physical infrastructures and curricula to the harvest calendar, and sadly, to the recurrent floods.

Hence, nobody is surprised that the tigers of the Bay of Bengal have learned how to fish. Nevertheless, those less nimble at fishing with their fangs underwater try their luck by migrating to India, crossing the jungle that unites both countries.

Barefoot

If a streak of tigers get tired of the floods, it can migrate north towards India. This was more or less the trip made forty years ago by a young Hindu man named Bunker Roy.

After finishing his university studies, Roy left home to get a better understanding of what the interior of his country was like. His parents left everything ready so that, upon his return, he would be able to take up a diplomatic career, which would be for nought. Roy had other plans: starting a school. But not any school. A school without titles, without certificates, without official curricula, without walls and populated by those who are in need, and illiterate.

Forty years later, Bunker Roy's trip to the hinterlands of India would transform the lives of thousands: students of all ages that have not

only learned to read and write, but also to cook and even build solar panels, thanks to the Barefoot initiative. The Barefoot College is a non-governmental organisation literally built from the ground up.

Defying all logic, Bunker Roy created a school out of thin air. His sole objective was to educate those who had disappeared from India's school map. His instinct and energy were as strong as those of a Bengal tiger. Although India is today one of the world's leading economies, it is still home to shocking social inequality, aside the fact that it is the world's second most populous country, only trailing China. You might not run into them very often, but there are more than one billion Indians in the world.

Nevertheless, Bunker Roy did not shy away and decided to forget the traditional schooling

model that he knew. Because this model would not serve his purposes, he started the movement from scratch. He started by heeding his students' needs, and with the aid of the resources at his disposal, he reflected with the community about what would be useful to learn in such an environment.

The school that doesn't look like one

> They thought it would be better to have a model that would include anyone who had something to teach what the rest needed to learn

Bunker Roy did exact opposite of what we regularly do with schools around the world. Instead of following the precise instructions of an architect's plan, he drafted them with the community's help. Together they looked at the two big questions that define all educational institutions: What do we need to learn? and how do we want to learn it? With the aid of future students from the region they design their own educational project. They elaborated the plan together: the content, the areas and projects that could be developed. They rebuilt old premises and even constructed new ones, and organised schedules and groups in such a way that everyone would have the opportunity of attending. There is no excuse for missing class at a school that is always open. Thus, for children with long workdays, they created night schools. The tigers were not informed of this before migrating.

They sought the best professionals in the community, and established a strict policy of not letting anyone with university degrees teach courses. They thought it would be more sensible to bring true field specialists: grandmothers that could read, write or cook, farmers, women with legendary formulas for waterproofing classrooms. In short, anyone who had something to teach to those in need of learning. The school didn't need any "School Chancellor" to come by to tell them they were doing it all wrong. It was clear that this was no normal school, it was a school21.

As with the Shidhulai barges, the schools of the Barefoot College grew out of and were inspired by five core values: equality, collective decision-making, self-sufficiency and self-respect, decentralisation and austerity. But let's not fool ourselves. The austerity of its proposal is based on a model of human betterment which has taught them how to build solar panels, as well as a "college" for adult with a customised curriculum catered towards literacy development and agricultural skills, night-schools for children, an online store to sell their own textile products, along with many other initiatives that bring social dignity to thousands of people. The model has grown to such an extent that it has been exported thousands of kilometres away, to Sierra Leone.

> Barefoot schools are centres for learning and unlearning, where the student becomes the teacher, and the teacher the student

As they themselves put it, Barefoot schools are centres for learning and unlearning, where the student becomes the teacher, and the teacher the student. These are schools for putting unconventional ideas into practice, experimenting, making mistakes and trying again, because everyone has a place in them, especially those rejected by other institutions. Various models that make use of puppets and collective decision-making systems have been developed for small children, who are enthusiastic participants. At Barefoot Colleges no diplomas or certificates are granted. The value of what they offer rests on institutional flexibility, which they have knowingly allowed to flourish from their very beginnings. Far from feeling cornered by legislation, they have learned to adapt to their environment.

The Barefoot College learned from other success stories around the world how to respond, for themselves, to the questions of what, how, who and when to teach. Setbacks were not an obstacle for the development of one of the most innovative educational models of the 21st century. In fact, setbacks were their main driving force.

Pants for Aquaman

｜｜ The story should begin with my father, a famous submarine explorer. If I said his name you would probably recognise it".

Far from India and Bangladesh, at 372 5th Ave. in Brooklyn, I am reading a paragraph about the origins of Aquaman. It is the first issue of a comic series on the birth of this superhero.

Images come to mind of tigers swimming in the floods of another wilder and more exuberant Atlantis. I picture the Shidhulai barge patrolling, disguised as a school. How will they use the electric superpowers provided by the solar panel gardens? This super-boat, always on alert, navigates through the river channels carrying out an educational mission. What would Aquaman's adventures be like if he had grown up in Bengal Bay?

I am in the Superhero Supply Store in Brooklyn. The only store in the world where you can consult a map locating the hideouts of the worst villains in history, and then finish up your homework in the back room.

An air cannon, a particle laser, a secret identity kit, wall-climbing suckers –"the perfect solution for superheroes who can't fly"–, a thunder inductor, a proton pistol, cybernetic piranhas, flippers, mutating gloves, cloning fluid, capes of all sizes –depending on what's in season–, metallic bracelets, antimatter, anti-gravity, a bottle of chaos, and even kryptonite. All of this, and much more, is displayed on the store's shelves –the only place in the world where superheroes do their shopping. "Aquaman found his pants here", asserts the shop assistant with a smile.

A young mother glances at the secret map section. Next to her, a teenager tries out several masks. Looking at the mirror, a mysterious man tries to go unnoticed while posing with a neutron pistol... Which superheroes are hiding behind these false identities? Am I standing next to Wonder Woman, Spiderman or a secret agent? The noise from the back room diverts my thoughts away from the suspicious buyers.

At the same store where the X-Men get a corporate discount, dozens of kids spend the day at a unique customised tutoring program. Volunteers of all ages have a one-to-one session with students, and together they complete school tasks. Here they will learn to write their own novel, and to discover their own talents, that is, superpowers. Absorbed in the magical ambiance of this peculiar store, I ask myself about the superpowers of its owner.

> **Volunteers of all ages have a one-to-one session with students, and together they complete school tasks**

Educational pirates

Ten years ago, the writer Dave Eggers had the crazy idea of opening a store for pirates in San Francisco. In reality, the pirate store was only a front. Dave's real objective was to help out the neighbourhood's vulnerable kids with their school work. He wanted to make sure that they wouldn't let one of life's best opportunities go to waste. But they would do it through their own efforts, and discovering their own talent.

Dave started by setting up a large space in the back room of his store. He took pains to fashion tables, chairs and other classroom objects. He created teams of volunteers, mainly composed by writers and artists, and after some preparation, they waited for the children to come in. The surprise was that the children didn't come. It didn't make any sense... They had been so motivated!

Eggers and his group of friends wondered what could have happened. They took a look around and it didn't take long to realise that the locale was far too conventional. It was a space, after all, suited for adults, but utterly uninviting for children. Moreover, they didn't want children to come forced by their parents. This was a place for creating and experimenting, a place to learn like no other.

It wasn't until several weeks after that they realised that they needed something more than a conventional store in order to establish a connection with the neighbourhood's children. They needed to know who they were, what they liked, how to attract them, how to use the space in a more appealing and intelligent way, how to organise activities in which they could learn by having fun... They needed to motivate the children with the space.

1. THE SECRET OF THE SUPER-SCHOOL

> **The improvement of education comes by way of improving the schools: we need to change their most basic structure, the pillars to turn it into a 21ST century**

Someone mentioned an old nautical supplies store, someone else spoke about adventure, another about creativity, and one said: "Pirates! Eureka! Pirates!" Eggers' team had hit the bullseye with an idea for a new, unique shop. And as they had nothing to lose, what could they possibly risk by designing an educational project full of nautical gadgets?

A few months later, this peculiar pirate supply store was packed with kids. A personalised educational project, unique around the world, was taking place. There were glass eyes, eye patches, gabardines, treasure maps, shovels, rum bottles –without alcohol–, and wooden leg replacements of different heights. All of these things, in addition to being necessary supplies for pirates, were part of an efficient façade for an educational model. A façade that worked very well in the eyes of the more incredulous and unmotivated students. The kids from the neighbourhood couldn't resist the store's charm, and slowly, they began to learn at the pirate store.

This first initiative by Eggers paved the way for hundreds of different spaces around the world. Educational façades of all types, such as the superhero supplies store in Brooklyn. Eggers himself recounts it in *A Heartbreaking Work of Staggering Genius*. This educational project connects the experiences of the organisation 826 Valencia to hundreds of colourful but fundamentally efficient educational spaces. Experiences that, far from India and Bangladesh, bring to mind stories about different schools, night schools and boat-schools.

From Brooklyn to Bangladesh, in India, and in hundreds of places around the world, there are educational experiences constituting a new school model. A model that grows, innovates and is transformed to the rhythm of those involved, science, the environment, and the times.

Learning is one of the most exciting experiences of our lives. This book seeks to tell you why and how to achieve it. The improvement of education comes by way of improving the schools: we need to change their most basic structure, the pillars to turn them into 21ST century institutions. This change is born from the conversations, the schedules, the evaluations, the methodology… ultimately, from citizens' everyday activities. We can drive change based on research and success stories. The transformation of schools today is essential for our future prosperity. Yet, when was the last time you visited a 21ST century school?

IDEA

4x4 growth model

For many years, the school has been a place of orderly rows and subjects. Teachers worked independently in each area and their monologues were front and centre. Occasionally, time was set aside for student dialogue, but speaking was seen as counter-productive. Final tests were the sole method of evaluation, and IQ tests, the most efficient method for dividing and making groups. The notebook, the book and the pen were fundamental study tools, and above all, silence was the best indication of success.

1. THE SECRET OF THE SUPER-SCHOOL

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> A school21 is a personalised learning community that acts, changes and grows to suit its circumstances

Yet, as strange as it may sound, we do not criticise these schools. This was a valid model, for another time. This is a book about "super-schools": schools that are doing very well, that have created another model, a new school model for the 21ˢᵀ century It is about the common pattern of success that these innovative educational experiences represent. They are schools21. Different from the others, but similar to one another.

The educational community of Barefoot College, the school-boat from Bangladesh, and the pirate and super-hero educational experiences of 826 Valencia are only some of the many examples that you will see in this book. I've had the fortune of seeing a lot of these schools in person, with others I've had email exchanges. Undoubtedly, they are all very exciting.

The educational experiences mentioned in this book have been chosen to give an example of the main transformations taking place by the most innovative schools around the world. This is the new paradigm to define a new school, one needing a new name. We've agreed to call it schools21. A school21 is a personalised learning community that acts, changes, and grows, one that is attentive to the present, to research and to both global and local realities. It teaches each student to live, to carve his/her own identity, and to discover and transform the world of the 21ˢᵀ century.

The experiences of these schools21 will serve us as examples for better understanding the basis of their development. They will show us the reasons and particularities of scientific research. We consider those schools that are so boldly transforming the school experience of today and growing atop a solid base resting on four sources. These are the sources of their curricula, the ones that sustain, foment and provide the scientific proof of their transformation. At the same time, these sources are what makes organisational and cultural changes possible.

It is a simple model: four sources to indicate the direction we should follow and the whys in all these changes, while the four pillars indicate where and how we change. An innovative educational guide with 4x4 traction.

METHOD

The sources of inspiration for the curriculum

A school is not a water-tight entity incapable of identifying epochal changes, scientific advancements, or societal evolutions. The curriculum is a kind of living skeleton that transforms the work done at school. It innovates and adapts to the new times through changes in the curriculum fundamentals. As we already know, there are four main sources guiding change at schools:

➡ Attention to human behaviour and learning processes is part of the **psychological source**. The psychological source draws from neurological studies and from other studies about intelligence, thinking, decision-making, etc. In short, from any substantial study that can help us in further grounding

THE SOURCE OF THE CURRICULUM

PSYCHOLOGICAL BASIS

Attention to human behaviour and learning processes.

PEDAGOGICAL BASIS

In charge of innovating methods and the educational practices of teaching processes.

SOCIOLOGICAL BASIS

In order to achieve success in learning, the school must adapt to changes in society.

EPISTEMOLOGICAL BASIS

Scientific advancements and technological studies give us certain clues to confront these educational changes.

our project and learning processes. Psychological research helps us take smarter decisions during the transformation of our school. The pirate and super-hero projects, for example, were underpinned by theories of learning-by-discovery, and by important research on games and learning. Similarly, the participative education proposal from the community at Barefoot College demonstrates how collective implication can improve academic results, without the need for certificates or diplomas. An educational application based on socio-cultural learning theories.

The **pedagogical source** establishes methodological innovation for teaching practices and learning processes. Pedagogical research identifies the most efficient teaching methodologies, and helps schools adopt more didactic structures. Dave Eggers's experience was based on a personal tutoring model that has helped thousands of kids finish their studies and bring out the best in themselves. Valencia 826's educational project broke away from the traditional homework support model. Cooperative learning was the driving force for important decisions and create a successful project. All of this is thanks to

> These four cornerstones envisage the school as a global unit, and make it possible to plan changes in a more balanced and integrated way

evidence coming from the pedagogical source, which leads to project-based learning, evaluation tools, pedagogical research, etc.: the keys for transforming the school. We will look at the main research guiding the transformation in chapters 3, 4, 5, and 6.

In light of the clear progression of science, such as the discovery of a new planet, or the development of advanced computational languages, the curriculum's **epistemological source** introduces new content in the study plans, and redesigns old content with the aid of new tools and media, such as computers or other mobile devices. Scientific advancements and technological studies give us certain clues to confront these educational changes. Guided by the epistemological source, Bunker Roy created his own plan for schools in India. The community at Barefoot College analysed what skills were most necessary in their environment, and adapted the educational project according to their conclusions. In this way, they were able to align contents as varied as textile production, literacy development, digital literacy, solar panel installation, plumbing and Indian cuisine.

Going through societal and environmental changes implies renovating our educational projects. When the will for change wells up from within the society, innovation becomes that much more urgent. This is what the **sociological source** refers to. The flooding and storms in the mangroves were Abul Hasanat's inspiration for creating barge-schools. The drastic environmental changes in Bangladesh forced thousands of families to adapt to a new educational, and eventually infrastructural, project. Schools were transformed into barges. But the sociological source does not only take from the local environment, it is constantly nourished by successive generations of students. Dave Eggers has shown that the youth of the 21st century need diverse educational projects in order to achieve success in learning.

These four sources are not entirely independent of one another. Many of their indications are intertwined and point in convergent directions. Like four compasses working in unison, the four sources of the curriculum give us the direction of the changes at schools. Pointing north there is innovation, which allows us to define our identity as school21. We will discover it chapter by chapter. However, having reached this point, a logical question arises: Where and how to apply the research and changes indicated by the sources of the curriculum in my school's educational project? Let's discover the secret of the four cornerstones.

How does the school change?

> The 4x4 model that I propose is a useful map for guiding educational innovation and growth. It converts the need for change into an opportunity for improvement

The transformation of educational projects differs from level to level. Changing the physical structure of classrooms and libraries is different from changing the didactic tools that are used in them. Let's look at a specific example. The 826 Valencia model was guided by the generational changes indicated by the sociological source. This was the basis for transforming the time and space management structures. It created pirate and super-hero stores (truly one of the more astounding transformations of the educational space). Furthermore, the socio-cultural theory of learning from the psychological source and the cooperative learning from the pedagogical source, inspired the organisation to aid all those who were interested and curious. In this way, they created personalised tutoring programs. More than any other external change, they managed to completely transform the role of children and volunteers; the way in which they interact, learn and teach.

The way in which schools manifest the evidence from the curriculum sources is structured around four main cornerstones. These four cornerstones encompass the school as a global unit, and make it possible to plan changes in a more balanced and integral way. This ensures these changes are done systematically, and are not simply disorganised interventions. They are a good way to organise our road to innovation and becoming a school21.

➔ The first cornerstone deals with the materialisation of the necessary changes with regard to content and teaching tools we use in the classroom. For example, the psychological source showed Bunker Roy the success of using puppets and role-playing in the education of illiterate children. This cornerstone refers to **content organisation, methodology and evaluation**. The way in which classes are organised into more active didactic units or projects, cooperative learning, design thinking, or the use of different evaluation systems are the centrepiece of change at all schools21 (we will see this in more detail later).

➔ The way in which **students and teachers relate to one another** and the roles that they play, indicate the changes outlined by the second cornerstone of transformation. At school21, the learning and teaching functions performed by students and teachers are re-defined. At the pirate school, for example, closer relationships between the teacher and student were established through personalised tutoring. Education in this model is not solely about supplying information, but

> **There are many ways to guarantee that the space be used intelligently for the purpose of enhancing the learning process, leading to more possibilities beyond chairs in rows**

about collaborating and advising, defining personal goals, meeting objectives, developing projects or even learning how to teach. In this model, perhaps, it is the children themselves who teach one another.

→ The third cornerstone refers to the centre's **planning and organisation**. In order to function, schools require a great deal of planning, for example, plans for communications, tutoring, family relations, and cohabitation and social harmony. It is also necessary to manage the use of time into schedules and groups. With this in mind, the educational community model elaborated by the Indian schools provides many examples of these changes. Their planning is based on psychological and pedagogical research into learning communities. The Barefoot College proposes a democratic, horizontal, and participative model of communication and learning, shared by many schools around the world. In this cornerstone, with the help of studies on intelligence from psychological source, measures can be taken to change tutoring plans, for example. It is also the cornerstone that allows us to improve our plans for integrating information and communications, technologies. Driven mainly by the epistemological source,

and why not, by the lessons of younger generations from the sociological source. Everything related to planning and leadership changes from this point on.

→ The fourth cornerstone refers to **the use of space**. The social reality of the south of Bangladesh sharpened Shidhulai's resourcefulness, who managed to turn a problem into an opportunity by building a barge-school. Dave Eggers's creative team of friends also demonstrated their cleverness in their re-conceptualisation of the educational space. The way in which use the hall, library, meeting rooms, or classrooms, is representative of the four cornerstones of the curriculum. The purpose is not to bring down walls, or to throw the whole school model out the window. Nor to start superhero supply stores on every corner! There are many ways to guarantee that the space be used intelligently for the purpose of enhancing the learning process, leading to more possibilities beyond chairs in rows (one particular space is valid for promoting one type of behaviour or action). Nevertheless, many schools have already created spaces for sharing, gathering, collective thinking, individual reflection, teamwork and make exhibitions. The school can be conceived as both museum and a talent seed-bank, a start-up, a focus booth, or an emotional library.

	SOURCES			
CORNERSTONES	**SOCIOLOGICAL BASIS**	**PSYCHOLOGICAL BASIS**	**EPISTEMOLOGICAL BASIS**	**PEDAGOGICAL BASIS**
CURRICULUM, METHODOLOGY AND EVALUATION	Focal points and connection with reality	Varied and adaptable tools	Expanded/ interconnected curriculum	Real experiences and projects
STUDENT AND TEACHER ROLES	Community of learners	Experienced designer	Agreements and monitoring shared among students	Guide, mentoring, and "TED" transmission
PLANNING	Horizontal planning	Participation	Communication/ transparency	Community
SPACE AND TIME	Mobility and expansion	Variety in spaces and metaphors	Digital building	Modules and schedule choice

A model to design your own school21 project

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> By making a map of your own school, you will be able to convert your needs to change into opportunities to improve

By crossing the curriculum sources with the cornerstones of a school we create a 4x4 matrix. This matrix allows us to organise our own project of change and innovation. With the curriculum sources along the horizontal axis and the school cornerstones on the vertical axis, we get a square with 16 tiles. This graph is a useful tool for collecting evidence of societal or pedagogical changes.

For example, what do you know about your immediate environment? And, consequently, what impact does the environment have on the way you plan your school? Also, what do you know about the psychological research into the multiple intelligences model? How does it change classroom methodology? How does it change student and teacher roles? Don't worry, the changes in the curriculum sources are profound, and some of them are quite novel, so we will study them step by step.

There is no doubt that education is very much in vogue. From different perspectives, many institutions are seeking to revolutionise their educational models. Some are driven by neuroscience research, others in emotional intelligence, and there plenty of initiatives asserting that the change will come from new technology or a certain mobile device. Good intentions and a desire for revolution are common to them all. Although, in many instances, we come across rather narrow perspectives.

The study of the evidence provided by the sources of curriculum and school cornerstones allow us to generate an integral and organsied proposal. This working methodology installs progressive steps into a coherent innovation project. It integrates all of them into a coordinated proposal, without giving more prominence to one area in particular and forgetting the rest.

It is why the 4x4 model that I am proposing is a useful map and guide for educational growth and innovation. By making a map of your own school, you will be able to convert your needs to change into opportunities to improve with a holistic, non-segmented perspective. More importantly, you will be able to discover your school's superpowers, that which makes it a unique institution. All schools, like people, are different and unique.

In any case, you won't find this map at a Super Hero Supply Store, nor is it a treasure map waiting for you at the pirate's store... It hides a treasure and it is a unique map, as much or even more than the super-villains' hide-outs. But, as with all superpowers, it can only be discovered as a team. Residing in you, in each student, teacher and parent is the potential to discover your school21 identity. The 4x4 model marks the route for our journey. After all, becoming a super-school is not as complicated as it sounds.

What can I do in my school?

ACTION

1 Dust off your educational project. The school project should be a living document, one that is constantly revised. Make the project an integral part of your establishment's day-to-day routine. Re-read it and determine which parts need modification in accordance with the four curriculum sources.

2 Connect to your environment. Go outside and discover what the unique characteristics of your school's reality are. Determine its strengths and weaknesses. You will find great opportunities if you are bold enough to convert the needs of your environment into the main driver of change. This will give meaning to your school and turn it into a unique project.

3 Interview your educational community. Reality is much more than statistical data. Do you know your teachers? Are you aware of your secondary students' interests? Do you share similar concerns with their families? Make use of interviews or qualitative methods to get the most useful information as possible about the people in your community. They will give you the keys to your growth.

"

The school project should be a living document that is constantly revised

4 Discover your school's superpower. Each school is different, each school is unique. Your school's talent has evolved throughout its history with the help of the people that have built it day after day. What strength makes your school unique? Discovering it will guide your project and give you the keys to the future.

5 Dream your school. Do you remember what your school was like ten or fifteen years ago? How has it changed? Close your eyes and take a few minutes to dream about the school that you would like to build. Use your imagination to visualise the school that you would like to be in ten years from now. Dare to dream as a team!

6 Build your own time machine. Hide a treasure in the garden or in the school's patio. The treasure can be an educational project, contents, assignments, presentations... Do it with the help of the littler ones, and wait until they grow up to dig it out. It's like travelling back in time. How much do you think your school will have changed during this period? And your role as a teacher, or as a parent?

7 What is your school's DNA? If every establishment has specific strengths, and ways of being unique, its evolution should be visible in the students. How do you imagine your students when they finish school? Describe the strengths that make them unique, and that define your school's DNA.

8 Re-design your educational project. Make a mental map of your educational project, turn it into a story, into an image, or a logo. Encourage your students to stage it, or have them make a multimedia mural. Display your project in halls, playgrounds and classrooms. Do it in distinct and original ways, show your unique character. You can also hold artistic, narrative, audio-visual and creative competitions, both for students and parents.

9 Create your own 4x4 school21 map. Create your own innovation project. Do it with the help of your peers and with the school's families. What do you know about changes in the sources of the curriculum, and what specific applications are there at your school?

10 Keep reading. The trip has just begun.

BIBLIOGRAPHY

- John ABBOTT, Heather MAC TAGGART: *Overschooled but Undereducated. How the Crisis in Education Is Jeopardizing our Adolescents.* Continuum, London New York, 2011.

- **Guy CLAXTON:** *What's the Point of School? Rediscovering the Heart of Education.* Oneworld, 2010.

- **State School Board**: *2012 Report on the State of the Education System.* Ministry of Education, Culture, and Sport.

- **Juan Manuel ESCUDERO**: *Design Development and Innovation of the Curriculum.* Síntesis, Madrid, 1999.

- **Ivan ILLICH**: *Deschooling Society.* Virus, Madrid, 1985.

- **Ferran RUIZ TARRAGO**: *The New Education.* LID, 2007.

- **McKINSEY:** *How to Turn a Bad Educational System into a Good One?* McKinsey and Company.

TO LEARN MORE

Project 826 Valencia worldwide

www.826valencia.com
and www.superherosupplies.com

Schools and non-governmental organisations that have been transformed into pirate ships, laboratories, circuses, and even super-hero stores, by developing original tutoring and monitoring projects. These projects are creative, personalised, and have students and volunteers of all ages.

Schools21 on wheels or on rails, India

www.doorstepschool.org
and www.ruchika.org

Doorstep Schools brings education to thousands of kids unable to attend regular centres due to their long workdays. To do this, schools have been turned into buses. Large lorries have been emptied out and transformed into schools with chalkboards. Several educators transport children to and from work, and teach them on the way. Thanks to its design, the travellers become students once they step on the bus. With the same objective, but on rails instead of wheels, the organisation of Ruchika is holding courses in train stations and wagons.

The Barefoot College in India and Sierra Leona

www.barefootcollege.org

Schools understood as learning communities, without tests, without certificates, and without qualified teachers, that are helping hundreds of people of all ages to improve their skills .

2. HOW ARE WE INTELLIGENT?

- ↗ Let's travel to Barcelona.

- ↗ We will understand the main changes in the study of intelligence, and how they relate to schools.

- ↗ We will learn to enrich our programme through a more personalised, creative and inclusive programme model thanks to a diverse and original palette of activities.

SEE VIDEO
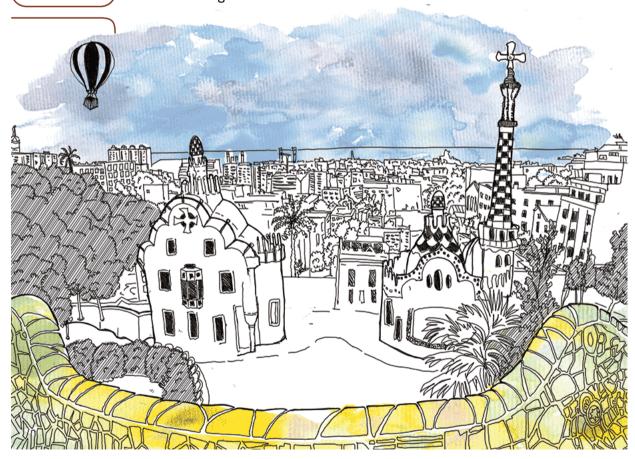
Learning in a thousand different ways

JOURNEY

The city of Barcelona is like a Gaudí mosaic. In its everyday beauty, passers-by and tourists from around the world barely perceive the Barcelona that is reflected from tile to tile. The fountains from the Plaça de Catalunya, the Sagrada Familia, a hefty slice of *pa amb tomàquet*, the façade of the University, the port, Barceloneta, Camp Nou, the nooks and crannies and narrow streets of the Gothic District, the Rambla… it is all part of Barcelona, piece by piece, fibre-glass and tile, the mountains and the sea… and also Colegio Montserrat.

In the classrooms of Colegio Montserrat, the children can work individually or in groups. It is surprising to see them move freely around different spaces, and actively collaborating with teachers. The learning space is so well designed that they can work in huge rooms carrying out different activities simultaneously, three classes at a time, with as many teachers moving from group to group. Despite the atmosphere of diversity and movement, concentration stands tall.

The classrooms are well lit, configured by flexible glass walls. On the first floor, students have their hands all covered in paint. Others are building –or "prototyping", as they put it– with cardboards, wood and other materials in another space: the atelier. This small workshop has all the tools regularly used by painters and artisans. In the youngest groups, they learn the alphabet through gestures (they call them "fun-gestures"). They merrily sing to the teacher's rhythm. Each letter is a tile in the complex geometry of language; a fun-filled alphabet holding the keys to the world's mosaic through representation. Teachers use images, sounds, their own bodies, and their memories. They learn within a holistic comprehension of intelligence.

One can hear the revelry of a big party coming from the main hall. It's the welcome ceremony. The whole primary school is gathered. Even students barely one year old come to participate in the early stimulation programmes. The smaller ones sit next to their older peers, the big six and seven-year-old ones who help them join in a song. Together they share the day's programme, which revolves around Gaudí and his mosaics. What a coincidence!

> Several students are measuring the floor. It looks like some of them are using their body parts, like their arms or legs, while others are using different objects

At today's assembly they are looking for similarities between nature and the most common architectural features of the famous architect's buildings. Images are projected on a big screen. Suddenly, leaves and seashells start to look like arches, lintels, and edgings. The great dragon of Park Güell has also come to the party. Gaudí took his inspiration from a tiny salamander. In the diversity of nature's shapes and colours he discovered a great source of inspiration.

"Gaudí had very good spatial intelligence, that's why he built such beautiful houses", says a 6-year-old to his peer, "and he was a naturalist", adds his teacher. "Look at how he got inspired to imitate all of these forms that we find in nature. Where can we find another one?" So this week Gaudí gets a privileged place in the school's project.

In the wide-open learning spaces on the upper floors, several students are measuring the floor. It looks like some of them are using their body parts, like their arms or legs, while others are using different objects. In teams, they take notes while using their own steps as measurement. If we could listen to the voices of the group in the corner, we would learn that they are free-styling with the main units of weight and measure.

IDEA

How are we intelligent?

In the 70s, Howard Gardner alternated between two jobs that would mark his career in a very special way. In the mornings, he worked as researcher for Aphasia Research Center at the University of Boston. He studied patients that suffered from language disorders and other types of cognitive and emotional disorders linked to cerebral damage. During the evenings he participated in Project Zero at Harvard University. There he studied the development of cognitive capacities in children of different ages.
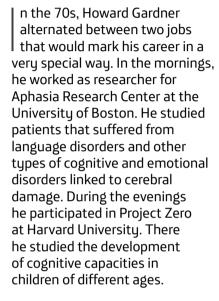
After several years of research, in 1983 Howard Gardner published his book *Frames of Mind: The Theory of Multiple Intelligences*. Almost two decades later, Gardner continued his work and came to define intelligence as the "bio-psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture".

> **"**
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> Intelligence is the bio-psychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture

➲ Linguistic intelligence implies the capacity to learn and use languages for the purpose of fulfilling specific objectives. It has to do with a certain sensitivity for spoken and written language, for example, in orators, poets, writers and lawyers.

➲ Logical-mathematical intelligence refers to the ability to analyse problems logically, to solve mathematical operations and to undertake scientific research. It is the intelligence of scientists, engineers or mathematicians.

➲ Musical intelligence is the ability to interpret, compose and appreciate musical patterns. It is the distinct intelligence of composers, musicians and other artists. Putting together a rap with the aim of remembering the basic standards for converting units of measure is a concrete example of how our learning abilities can be enhanced by our musical faculties.

➲ Bodily-kinesthetic intelligence has to do with the capacity to control one's body for solving problems and for handling objects skilfully. It is the distinct intelligence of dancers, artist and athletes, but also of mechanics or laboratory researchers.

➲ Visual-spatial refers to the capacity to recognise patterns in diverse spaces. It is the intelligence of sailors, sculptors, designers, surgeons and pilots.

➲ Naturalistic intelligence implies the capacity to recognise and classify living beings and environments, to create taxonomies and to interact with living elements by means of such representations. No one doubts, for example, that the creativity and work of Antoni Gaudí is a clear demonstration of the co-existence of logical-mathematical, spatial and naturalistic intelligences, an incredible combination achieving a unique architectural expression for our culture.

➲ Interpersonal intelligence has to do with the capacity to understand the intentions, motivations and desires of others. It is the intelligence that we find in our relationships with others, in leaders, educators, social workers, actors, religious figures, doctors and psychologists.

➲ Intrapersonal intelligence encompasses introspective and self-reflective capacities; the ability to create a personal model that is useful and efficient, and to use this information to narrate our own identities.

METHOD

An intelligence toolbox or palette

Bruce Campbell, in the search for practical and creative applications, has conducted several experiments at schools in Seattle, in the United States. Campbell designed different spaces dedicated to each intelligence type. Spaces throughout the whole school were used, as well as the corners of each classroom. In these "intelligent spaces", both students and teachers were asked to study the contents of the curriculum through activities, materials and exercises that were adjusted to the specific potentials of each intelligence type. On another front, Thomas Armstrong has elaborated a series of educational strategies related to these intelligence types. Similarly, David Lazear created a toolbox with activities in function of each intelligence, with the aim of making them more useful for each area in the curriculum. It is worth noting, in this journey in the search for better practices, the publication *Una experiencia a compartir: las inteligencias múltiples en el Colegio Montserrat* [*An Experience to Share: Multiple Intelligences at Colegio Montserrat*], a book that narrates the school's transformation into a school21, from its early stimulation

> **Colegio Montserrat has generated a model known as the "intelligence palette": a graphical representation for planning in the classroom**

programmes with the youngest pupils to the development of multiple intelligences, curriculum-wide.

Colegio Montserrat has generated a model known as "a palette of intelligences": a graphical depiction used for classroom planning, allowing teachers to enrich their students' comprehension through specific activities defined according to each intelligence type. Colegio Montserrat is proof that in order to turn our schools into beacons of education in the 21ST century, personalised and enhanced curricula are the springboards for kick-starting change.

Taking into account the various proposals that are developed each day in the classroom, what type of activities are explicitly oriented towards each intelligence? Let's look at some of them:

➡ For **linguistic intelligence**: writing all types of creative texts without imposing limitations; making oral presentations, poems or word games, recordings, diaries and publications; explaining subjects in conference-style or journalistic formats; holding story or joke-telling competitions.

➡ For **logical-mathematical intelligence**: creating formulas to organise the curriculum's content, quantifying real-life elements, making estimates and classifications, making up games involving numerical or logical operations, writing premises and syllogisms, deciphering or inventing sequences and patterns, generating graphic organisers and deducting premises in accordance to variations and changes in content.

➡ For **musical intelligence**: generating rhythms, writing songs, employing environmental or instrumental sounds, relating tonal and musical patterns to contents, musical role-playing, building instruments, representing orchestras, and relating tones and music to ideas and concepts.

➡ For **visual-spatial intelligence**: encouraging guided visualisations, using colours in the organisation of information, generating graphical metaphors, drawing sketches, creating graphical symbols, designing graphical contents, elaborating puzzles, creating collages, sculpting and simulating spaces with the imagination.

➡ For **bodily-kinesthetic intelligence**: generating corporal responses related to specific concepts, creating sculptures of people, representing ideas with body parts, and using body parts to solve problems, role-playing, mimicry, relating ideas to kinaesthetic concepts, creating and manipulating objects.

➡ For **naturalistic intelligence**: recognising natural archetypes, holding walks and learning by looking out the window, simulating the natural world, observing and relating concepts to plants and pets, elaborating ecological diaries, building taxonomies, promoting the steps of the scientific method and stimulation exercises, creating school gardens and using microscopes, telescopes and other research tools built into the curriculum.
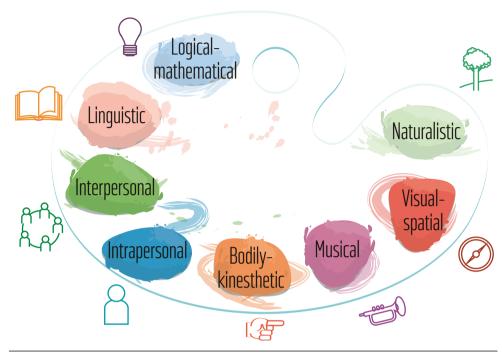
THE INTELLIGENCE PALETTE

> Taking into account the various proposals that are developed each day in the classroom, what type of activities are explicitly oriented towards each intelligence?

⊙ For **interpersonal intelligence**: creating cooperative groups, promoting empathetic practices, recognising other viewpoints, understanding their motivations, adopting roles and using them when relating to peers, recognising behavioural patterns linked to specific roles for teamwork, simulating dialogues, writings and motivations from figures in the curriculum, and inventing biographies.

⊙ For **intrapersonal intelligence**: reflecting about learning, recognising types of thoughts and feelings, discovering your own strengths, carrying out meta-cognitive activities, establishing goals and studying objectives, narrating a self-learning biography, imagining other states and thoughts related to figures being studied, and linking them to your own biography.

Write understanding goals for the learning sessions that you would like to plan. Choose an activity for each intelligence, and manage the time and resources that you need. It is time to enrich your work and to learn from all of these intelligence types. These indications will allow you to plan an education-based unit with a varied palette of activities. Maybe you can direct the classroom by guiding your students, or let them choose the order and complete all the activities. Perhaps you could also create space for each intelligence in the classroom, and allow students to move freely from one space to the other, having more personalised monitoring. You could even group students and teachers in the same room.

What can I do in my school?

ACTION

1 **Discover the potential of your own intelligence**. Like those of your students, your creative and learning faculties are diverse and varied. Focus on yourself and review what you know about your own intelligence before you begin teaching. You might remember moments in which you enjoyed learning, or share your concerns with colleagues and friends. Start by speaking about your multiple intelligences, but don't forget: Don't label yourself!

> Start by being positive and by informing educators and families about the theory that commands the most support for defining intelligence in the 21ST century
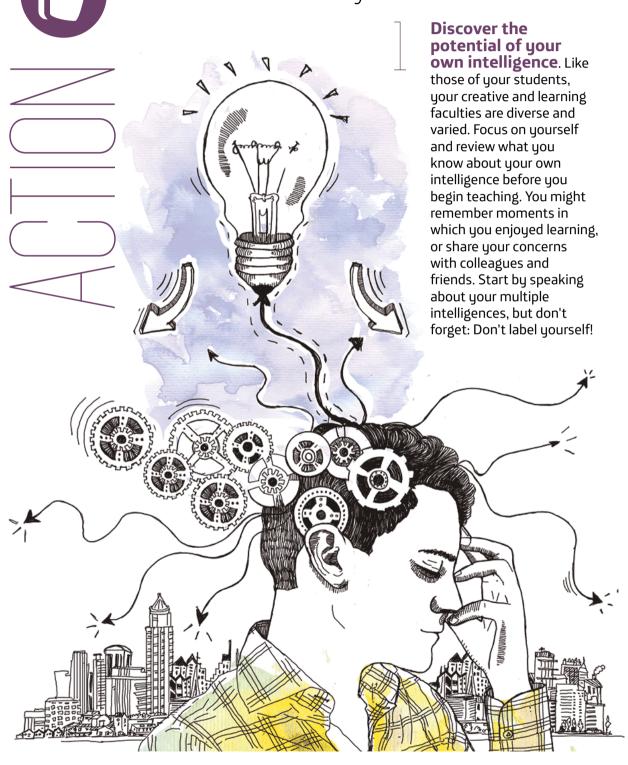
2 Celebrate diversity. Share the theory of multiple intelligences with your students and your educational community. It can become a recurrent theme during tutoring or vocational activities, or about getting to know oneself. Make use of narratives from figures who are important to our culture, like Antoni Gaudí. Start by being positive and by informing educators and families about the theory that commands the most support for defining intelligence in the 21ST century. Surely their desires to learn more about the theory will surprise you.

3 Put order in your toolbox. In the same way that David Lazear proposed the metaphor of varied activities such as toolboxes, you can expand the simile by reviewing the methodologies that you use most frequently in the classroom.

4 Paint your palette. If you already know what activities you use the most, and how they relate to each intelligence type... Are you ready to create your own palette? Think of a teaching unit, along with its learning objectives. Remember: What do I expect students to understand? Draw a painter's palette with eight spaces, and in each one, add an activity –taking Colegio Montserrat as a template. Once you have eight, set the timing, the resources and the spaces.

5 Share intelligence in the community and in specific spaces. Are you ready to create specific spaces with information about each intelligence type at your school? Long live multiple intelligence cork boards! Start with merely informative open corners in the playground or the hall. Later you can create "intelligent spaces" to conduct specific activities that encourage the adoption of these useful, innovative and original methods.

BIBLIOGRAPHY

- Marilyn FRIEND, Linda CAMPBELL, Bruce CAMPBELL and Dee DICKINSON: *Multiple Intelligences: Practical Uses for Teaching and Learning.* Troquel, 2000.

- Howard GARDNER: *Intelligence Reframed: Multiple Intelligences in the 21st Century.* Paidós, 2001.

- David LAZEAR: *Eight Ways of Knowing. Teaching the Multiple Intelligences.* SAGE, 1999.

- Montserrat DEL POZO et al.: *Una experiencia a compartir: las inteligencias múltiples en el Colegio Montserrat [An Experience to Share: Multiple Intelligences at Colegio Montserrat].* Tekman Books, Barcelona, 2007.

- María Dolores PRIETO SÁNCHEZ, Pilar BALLESTER MARTÍNEZ: *Multiple Intelligences. Different Ways of Teaching and Learning.* Pirámide, Madrid, 2010.

- Ellen WEBER: *Five Phases to PBL: MITA (Multiple Intelligence Teaching Approach).* MITA Center, New York, 2010.

TO LEARN MORE

Collegi Montserrat en Barcelona

www.cmontserrat.org

The place where multiple intelligences were the main driver of change and of the transition towards cooperative learning, and a project-thinking culture. A beacon for our country and for the "Teachers for Innovation and Change" programme in Catholic Schools.

Key Learning Community in Indianapolis

http://www.myips.org/keylearningcommunity

Implemented the first educational applications of multiple intelligences, and created intelligent spaces for learning.

Hellerup Skole in Denmark

www.hellerupskole.dk

The Hellerup school is a large open room, an enormous space of four floors that has organised its schedule, curriculum and educational architecture in accordance with the multiple intelligence framework. Students are involved in its theory, and in a deeper understanding about themselves and their talents.

3. LEARNING LANDSCAPES

⬈ Let's travel to Sydney.

⬈ We'll learn to plan by integrating thinking routines with original and creative activities from the multiple intelligence framework.

⬈ We'll create a great learning experience by integrating curriculum contents with challenges, dares and badges to be earned, all in a learning landscape where students can choose their own personalised itinerary.

SEE VIDEO

A theme park for learning

Sydney is a spectacular city. Our side of the world is the other side of the world for them. Thinking of who moved and where to always depends on your starting position and point of reference. That's why, looking at a world map in Sydney involves discovering a completely new perspective.

Northern Beaches Christian School doesn't have the structure you would expect from an ordinary school. It's not a big building where floors and rooms are successively organised by age or course types. It is not an elongated building either, where classes and rooms follow the same order, albeit horizontally. This school is a veritable valley of enormous classrooms. I want to cross a large hall with glass walls. A poster on the wall arouses my curiosity: The Zone.

Upon crossing the threshold, I have to rub my eyes to make sure I am not dreaming: the hall is gigantic. Standing before me there are about one hundred children aged 11-12 working alone, in pairs or in groups of three.

The children have conquered the space in search for a place to learn. The whole scene stages a wide selection of poses and postures. Some of them are standing straight and still, others are making strange and oblique shapes. They take up chairs, tables, cushions, pouffes, sofas, or they simply sit on the floor. They are all there, no doubt, you can hear the sounds of working, conversations, thinking minds and tapping on computer keyboards. It is the sound of minds brimming with ideas. Definitely what is not heard is the sound one might expect with hundreds of kids in one such space, and much less learning!

I am struck by the use that students make of the verbs "to define", "to analyse", and "to evaluate". "The activity consists in describing the characteristics of an animal from each taxonomy", says one girl to another, "not in defining it". "Oh, you're right! Good! I was already tired of so many definitions...", says her friend. The verbs "to create", "to compare", "to classify", "to select", "to develop", "to explain", "to order"... They frequently come up in conversations and in different activities.

This makes me think that each student is engaged in a different activity. I look at the teachers as they move between the children. They talk to each student and wait for others to approach them with questions. They direct the work of each student by giving them indications about time, quality of the final product in each activity or the objectives. Verbs like "to define", "to organise", "to classify", or "to create" flood the hall. However, their representation is rather varied. Someone is writing a text, someone else is making a graphic organiser and another is listening to music with headphones. It makes me think that multiple intelligences are at work in this hall. Everything is connected.

Personalised schools and classrooms

IDEA

Thanks to the experience at Sydney, and to the multiple intelligence model in Barcelona, we have seen how a didactic schedule with a variety of activities is possible if students are allowed to choose and given autonomy guided by the teacher's advice. The criterion that guides our planning cannot solely rest on the order of presentation given in official documents or the tables of contents. Only by sharing autonomy with our students can we re-design curriculum contents according to graded patterns that are both logical, varied and suited to the group and person we are working with in any given moment.

3. LEARNING LANDSCAPES

Teachers design experiences with the specific goals to be reached, tools for evaluation, and the end-products for each activity, but also concede autonomy to their students so they may choose their own path of learning by partaking in the decisions on what activities will become part of the course.

A 21ST century classroom is an exciting one. A classroom to learn, discover, organise and transform both ourselves and the world around us. It is fun, stimulating, challenging, thrilling, and does not mix up learning through repetition and oblivion with understanding, creation, creativity and meaning. In this classroom, the teacher is a designer of learning experiences. The teacher organises the content in a more engaging way for students by negotiating times, modes and tools in a process aimed at comprehensive development, lifelong learning and passion for being alive and discovering yourself and the world at school.

Schools21 revolve around learning. Shared learning among equals, both for teachers and students. The common destiny of knowledge shapes a society that transcends the school's frontiers. In this way, teaching consists of designing experiences that stimulate the potential for learning and in the establishment of interchangeable roles for a common purpose. At schools21, teaching grows smaller as learning takes on a bigger role.

These changes define the personalised education model that characterises schools21:

> " Teachers design experiences with the specific goals to be reached, tools for evaluation, and the end-products for each activity, but also concede autonomy to their students so they may choose their own path

- ⊙ Plan by contemplating a variety of models and activities, both in the ways of presenting information and in evaluating the ways students comprehend it.

- ⊙ Integrate well-defined cognitive strategies of learning how to learn by encouraging students to think about their own thinking processes. This will create a more aware and proficient learning culture.

- ⊙ Integrate cooperative strategies that improve student motivation and performance. As we will see further, these are crucial elements for learning in the 21ST century.

- ⊙ Integrate conflict in its diverse forms: surprise, enigma, dialogue or challenge. This invigorates the active construction of understanding and motivation.

- ⊙ Ensure student autonomy in decision-making by seeking ways of achieving more involvement and independence in the discovery and negotiation of personalised learning itineraries.

- ⊙ Design learning experiences according to the curriculum contents using graded and structured patterns that don't strictly obey the logical order stipulated by official documents or reference materials. Rather, content integration should come as a result of the materialisation of each of these principles through specific actions and practices.

METHOD

The matrix of The Zone

Integrating the variety of activities proposed by the multiple intelligence model with a coherent proposal for cognitive strategies is no simple task. This is why teachers from this school21 are using Bloom's taxonomy.

Bloom's taxonomy consists of six categories that define a varied set of learning strategies. These are organised in the form of a pyramid, understanding that the activities placed at the top involve a greater level of difficulty.

Teachers at Northern Beaches Christian School use a planning system based on the construction of a table that combines two key models. On the horizontal axis, they

> Thanks to the variety of activities that we have planned, different personalised proposals can be offered

placed the activities related to the multiple intelligence framework, and on the vertical axis they placed the cognitive strategies from Bloom's taxonomy. As a result, they obtained a matrix with 48 tiles. This original tool means different activities can be created and coordinated. It uses a rich methodology and a coherent space to integrate cognitive strategies throughout the learning process. Intelligence guides the "style" of each activity, the use of materials and the representation of the learning process. On the other hand, Bloom's verbs set the objectives and emphasise the evaluations and the strategies required.

In this way, the models intersect one another. For example, comparing the characteristics of different animal types through a graphic organiser merges the category of "analysing" with that of spatial intelligence. This also helps to recover your specific memory of each ecosystem, and to recall their main characteristics. It comes about through the intersection of the category "remembering" with that of "linguistic intelligence". Similarly, it's possible to create a category, gesture, or posture displaying the main characteristics of a type of animal, by crossing the category "create" with the "body-kinaesthetic" category, a so on. This way, we have a long list of creative and stimulating activities.

In order to begin planning with this matrix, start with the basic teachings and draft your learning goals, those that students are expected to understand through the series of learning experiences that we design.

For every box where the categories cross, the activities are identified on the following scheme, which should be presented to the students with all the necessary content:

- Title.
- Location resulting from the cross between an intelligence type and Bloom's categorisation.
- Learning objectives.
- Challenge (question or enigma to be solved).
- Result or final product.
- Materials and necessary content.
- Approximate time of execution.
- Evaluation criteria.
- Evaluation rubric for the final product.
- Close relationship with other activities in the matrix.

Thanks to the variety of activities that we plan, different personalised proposals may be offered; for example, at first a specific order might be established for the students to follow, an order based on Bloom's pyramid and taxonomy, beginning at the bottom until reaching the activities at the top. However, the experience from the learning scenario at The Zone has demonstrated that beginning with the creative activities situated at the peak of the pyramid may increase motivation in students, who may end up performing better and get more involved in the next activities. By creating a greater number of activities, the possibility for generating different itineraries increases; in this way, we can guide the students or give them great capacity to make decisions through the richness of a more personalised educational model.

BLOOM'S TAXONOMY

GREATER DIFFICULTY

CREATE
Gather knowledge and relate it to cultural elements for generating original, innovative and valuable projects or products.

Generate, plan, produce, design, build, imagine, draw, elaborate.

EVALUATE
Reflect about the state of learning.

Verify, criticise, revise, formulate, hypothesise, experiment, play, test, detect, monitor.

ANALYSE
Break down knowledge into different parts, work with them and see how they relate to the general framework.

Differentiate, organise, attribute, compare, de-construct, delineate, structure, integrate.

APPLY
Demonstrate what has been learned in both known and brand-new contexts.

Execute, implement, perform, use.

UNDERSTAND
Construct new meaning from what has been learned, and from new content.

Interpret, give examples, classify, summarise, infer, compare, explain, paraphrase.

REMEMBER
Call the relevant information to mind.

Recognise, list, discover, reuse, name, locate.

create
evaluate
analyse
apply
understand
remember

3. LEARNING LANDSCAPES

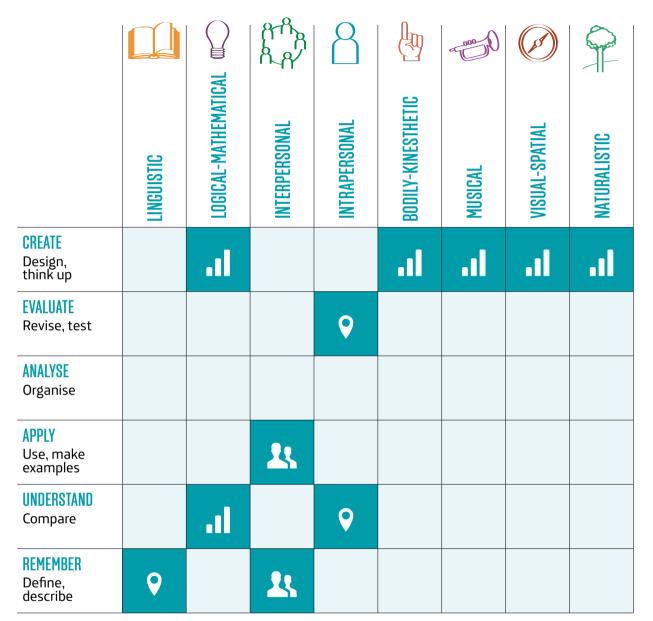|	LINGUISTIC	LOGICAL-MATHEMATICAL	INTERPERSONAL	INTRAPERSONAL	BODILY-KINESTHETIC	MUSICAL	VISUAL-SPATIAL	NATURALISTIC
CREATE Design, think up		▆			▆	▆	▆	▆
EVALUATE Revise, test				📍				
ANALYSE Organise								
APPLY Use, make examples			👥					
UNDERSTAND Compare		▆		📍				
REMEMBER Define, describe	📍		👥					

Among the benefits of programming a complete matrix is the possibility of generating badges or awards: a system for designing exciting challenges that highlight important motivational components.
The teacher may select those activities that he or she considers indispensable and grant prizes or badges –which don't count towards the overall qualification– by completing three activities related to one type of intelligence, or three activities related to thinking strategies, for example. Badges such as "Super-Thinker", "Charles Darwin" or "What an Artist!" can be useful to motivate students in reaching minimum requirements. Once obtained, the badges may be used to continue learning or to reinforce their qualities or interests.

ACTION

What can I do in my school?

1 **Bring Bloom into your school and classroom.**
The name bloom is a funny coincidence. We don't know if this had something to do with the researcher's intentions at the moment of developing his taxonomy, but it does allow your students' thinking to flourish. Present the taxonomy to your students, highlight the actions when you work with them, although not as simple exercises, but as cognitive strategies that can help the thinking processes bloom. With the aim of creating a culture that is more aware about learning, encourage reflective questioning in the classroom.

"

With the aim of creating a culture that is more aware about learning, encourage reflective questioning in the classroom

2 **Start with simple challenges.** Using the matrix, create activities based on Bloom's taxonomy and encourage students to identify different cognitive strategies. Now, try mixing activities based on the multiple intelligence theory with Bloom's categories. Invent five examples with the contents that you like the most in your subject.

3 **Autonomy Day or the 20% rule.** We must lose our fear of autonomy. Google has allowed their workers to spend 20% of their day working on whatever they wish. This motivational rule comes from Daniel Pink. As adults we are very frightened by student autonomy in the classroom. Set a day in the year in which students learn, or even teach, about whatever they want. Would you let your students use 20% of their weekly time to pursue their own interests? Sharing autonomy is a challenge for creativity, for responsibility and for shared commitments.

4 **Plan in group.** If you make a column and a colleague of the same course makes another —why not add them up and give autonomy to the students by letting them decide which activities are optional and which are obligatory? Would you be ready to gather all of your students in a single class, under this model, and with more than one teacher per class? You now have all the necessary elements.

5 **Try it out with one column.** Choose the learning goals, the content, and design an activity from each intelligence and category. At the end you must choose eight different activities. Why don't you take them to the classroom and enrich the palette model that we developed in the previous chapter?

6 **Having a matrix party.** Set a special day aside for working from the matrix at school, coordinated for a single cycle or stage. You can work in a special space, different from your normal ones, and extend time or use it as you wish. Play with the possibility of granting autonomy and enjoy observing your students' learning process.

BIBLIOGRAPHY

- **Sarah-Jayne BLAKEMORE and Uta FRITH**: *How does the brain learn. The keys to education.* Ariel, 2010.

- **Christopher DAY, Qing GU**: *Teachers: new lives, old truths. A decisive influence in the lives of students.* Narcea, Madrid, 2012.

- **Brian KEELEY**: *Human capital. What you know shapes your life.* OECD Publishing, 2007.

- **OECD**: *Understanding the Brain: the Birth of a Learning Science.* OECD Publishing, 2007.

- **Felipe SEGOVIA OLMO, Jesús BELTRÁN LLERA**: *El aula inteligente. Nuevo horizonte educativo . [The intelligent classroom. The new educational horizon].* Espasa Calpe, Madrid, 1999.

TO LEARN MORE

Northern Beaches Christian School in Sydney, Australia

www.scil.com.au

This community of schools at the centre of innovation and learning in Sydney is famous for being a worldwide leader in educational innovation. It has created a model that integrates multiple intelligences with thinking process taxonomies, organising curricula into modules, and giving students the freedom to autonomously choose their own learning itineraries.

Escolas Lumiar in São Paulo, Brazil

www.lumiar.org.br

Escolas Lumiar are three primary schools that share the same pedagogical motto: "Interactive and inter-disciplinary mosaics are the basis for building knowledge". At these schools there are no lessons, no fixed schedules, and no old-school teachers –as they put it. Quite the contrary, each day students freely work in three or four different projects that they themselves have chosen and defined with the aid of their tutors. Tutors ensure students progress with the support of a matrix for observing, grading, advising and measuring the development of key 21ST century skills.

Discovery1 at Christchurch, New Zealand

www.discovery1.school.nz

The Discovery1 primary school in Christchurch, New Zealand, designed the organisation, methodology, and evaluation for the community's official curriculum. Parents, students, and teachers, along with other education professionals and experts, worked together to redesign their school. With this philosophy they became a community of discovery, where students can make decisions about their own schedules, negotiate their own evaluation commitments with parents and teachers, and where they can develop their own products, ones that are so real and relevant to everyday life that they require a type of copyright.

4. TALKING TO LEARN HOW TO THINK

- ⊿ Let's travel to New York.

- ⊿ We'll learn to create and depict thinking routines, conceptual frameworks and mind maps.

- ⊿ We'll discover how to steer our conversations in order to create a culture of thinking which will guide the learning process through a dialogue between students and teachers.
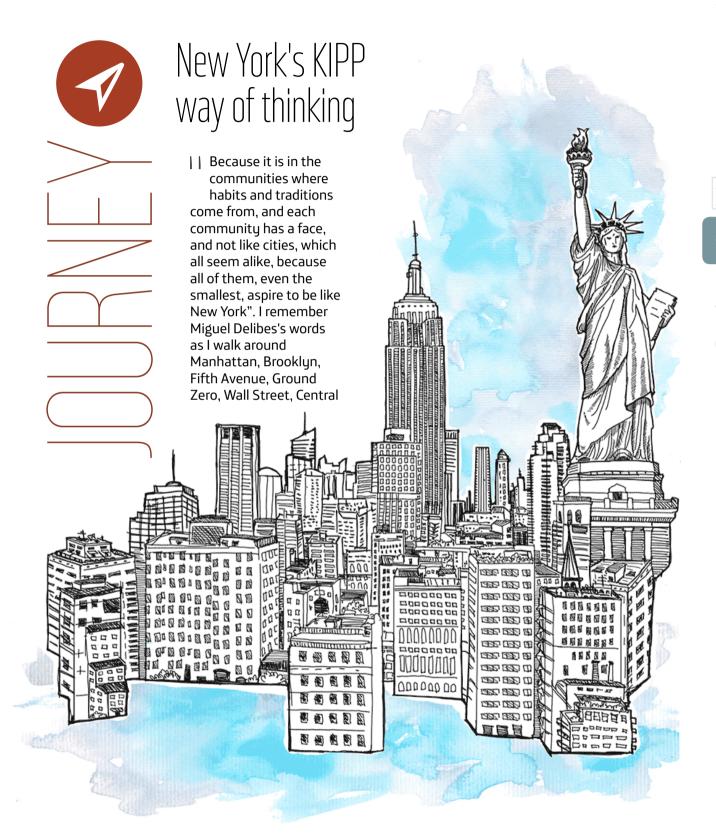
WATCH VIDEO

New York's KIPP way of thinking

|| Because it is in the communities where habits and traditions come from, and each community has a face, and not like cities, which all seem alike, because all of them, even the smallest, aspire to be like New York". I remember Miguel Delibes's words as I walk around Manhattan, Brooklyn, Fifth Avenue, Ground Zero, Wall Street, Central

JOURNEY

"

The KIPP schools form a large network of knowledge that spreads across the United States

Park, the Metropolitan Museum of Art... The city that never sleeps is the ultimate city.

New York belongs to everyone and no one. It may lie in the heart of every New Yorker, but it steers the thinking of the world. Regardless of whether you know the place, you have seen it reflected in your street and in every trend that surprises you. Because New York sets down the paths of our thinking.

The KIPP schools form a large network of knowledge that spreads across the United States. They work for those who would not be able to graduate if they did not have an alternative education. An education that involves learning to learn. Thinking in the best way and at all times, but always as a community, helped by the teacher and helped by the visualisation and representation of thinking through several different languages. Learning to think in order to think better while learning.

Visiting this school in New York is opening the key to your own mind. The corridors and classrooms are full of images representing the steps needed to make a decision, or the most appropriate way to defend your own arguments in a discussion. From class to class, teachers use dialogue to make thinking visible, as though it could be touched... The acronym KIPP means Knowledge is Power Program, and it really is.

"What is the basis for that argument? What proof do you have?", one student asks another. We have sneaked into Spanish class and the language of thinking governs conversations. "How do you deduct the grammar rule? What examples can you show me to defend your position?", asks the teacher aloud. I have never seen such organised thinking used to learn Spanish. "Represent the rule on your thinking page, showing all the evidence that you have analysed in each step", orders the teacher.

The language of thinking

IDEA

As we think, we recognise, select, organise and apply the language of thinking. Thinking is controlling, with a greater or lesser degree of awareness, the cognitive strategies that are the basis of this language, such as, for example, recognising, describing, comparing, selecting, defining, deciding, naming, classifying... In depicting thought, we can help ourselves with pictures or our bodies, or using diagrams, mental maps or visualisations, but also through communication. In guided participation between students or with the teacher, language is an efficient tool to recognise and regulate thinking.

Within the classroom, the didactic use of language is known as educational discourse. We are not using the term discourse in its most expository sense, which implies long presentations presented by the teacher. The discourse in our learning scenario is a presentation which activates the cognitive strategies of the student not only in the dialogue, the challenge, and the question, but also in the shared commitments and the knowledge of both criteria and the tools for evaluation. This includes individual accompaniment as well as a negotiation towards progressive autonomy and a more personalised model of education.

The discourse of the transmission of information has lost its meaning in schools in the 21ST century.

Language is the most sophisticated shared tool to explain the cognitive strategies which operate in our thinking. When talking of cognitive strategies, we are not referring solely to mental processes. Sociocultural theory has demonstrated that the interaction between people is a necessary social practice for successful learning. It is the first step before the more individual phase of internalisation, imbalances and the construction of knowledge diagrams with meaning. However, we have also proven that a learning strategy can entail, for example, arranging toy building blocks by colour, or displaying and describing a picture that we will later represent with our body, in writing or as a drawing. Therefore, when we refer to cognitive strategies, we are naming actions of thinking which happen within our mind as well as outside it.

Through guided practice, we learn what is useful to us as scaffolding for psychological internalisation. Therefore, the adjective "cognitive" makes reference to this essential internalisation: making the social, psychological and the external, internal. Consequently, it is unsurprising that, to accompany the discourse, we use all types of representations of thinking on a social level, beyond learning, especially those that, in practice, are chosen by the students themselves for their efficacy. The educational discourse, aided by scenarios, mind maps and pictures, helps to structure thinking on its social level and regulates it by supporting the process of internalisation.

Reading and writing about thinking make the process sound rather slow. However, thinking can be a question of milliseconds or minutes, but also of hours, months and years. In general, in our day-to-day lives, we activate thousands of cognitive strategies without being aware of their usage. This phenomenon is the reason that once we have acquired a habit of thinking, it is difficult to change. It is a question of cognitive economy. When we automate strategies, we can increase our mental resources in activities which, being new or difficult, require greater control and awareness.

If the brain is pliable, our thinking is too, but tendency and use create a habit of thinking, habit creates a routine and routine increases the resistance to change.
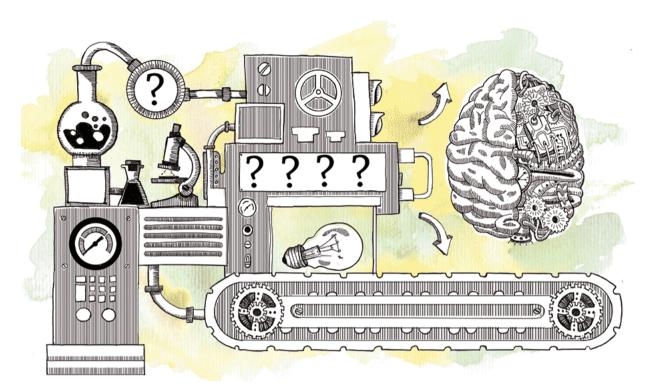
Integrating strategies of thinking

METHOD

➡ **Thinking in stop-motion.** Take a slow motion photo of the cognitive strategies that appear most often in your school. State the most common problems and challenges that the students face in each area or in a specific project. With the help of your classmates, make a common list for each department, or a general one for each stage, or for the entire school. Organise cognitive strategies by their relationship, similarity or theme. In this way, you can create your own thinking map. Hang this map on the classroom wall and create "thinking spaces", walls where there are examples from class or everyday life to explain each of the strategies. Visualisation of these strategies in a concept map or another type of organised presentation is very useful for integrating them into everyday life. Use words to present the thought, but also pictures; for example, a mirror for comparison, a tool box for classification, a compass for making decisions, a magnifying glass for definitions and binoculars for prediction. You can create the thought collage with the help of the students. Take advantage of unused corridors and corners to label cork boards or panels to show, for example, classifications or comparisons. This method of understanding and visualising

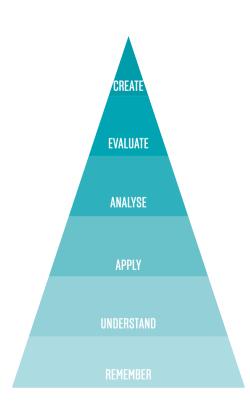> Take a slow-motion photograph of the cognitive strategies that appear most often in your school

thinking lets you introduce activities in the programme aimed at the competency of learning to learn, and it does so in a more organised way that is integrated with the content, instead of seeming like something tacked on. What is more, the systematic and comprehensive planning of all courses promotes coherence through the creation of a shared language of thinking throughout the school. Every class can display a map of the main strategies that we use in our school21. To develop these visual representations of thinking, Bloom's taxonomy model, which we saw in the previous chapter, can help you, or the model of organising different strategies suggested by Robert Swartz.

CREATE
EVALUATE
ANALYSE
APPLY
UNDERSTAND
REMEMBER

Paths of thinking. If we have managed to identify and organise the main cognitive strategies that we use, we can go a step further and design sheets or diagrams as visual and practical supports to guide the process. These sheets are organised either using positive guidelines for thinking or by means of open questions which encourage the process. Thinking paths function as an "external" mind which, initially on a social and exterior level, guide a process that will later occur on an internal and psychological level. These sheets become genuine scaffolds of knowledge and perfectly exemplify the potential of the sociocultural theory of learning. With the help of the teacher, other students and the thinking sheet itself, we encourage the process of internalisation with the aim of turning a thinking path into a routine that we successfully perform with ever more autonomy. Do not let your students be the only ones to complete them and regularly use them: you yourself should join in this exercise with them.

Think using words. Once we have managed to create a visual representation of thinking, it will be easy to keep it in mind in our day-to-day conversation. Look for times that require the student to use different strategies embedded within the content of the curriculum.

CREATION OF THINKING PATHS

Creative thinking

GOAL • Original product.

SKILLS • Alternative possibilities.
• Combination of ideas.

REPRESENTATIVE ATTITUDES • We should consider less common ideas.

Critical thinking

GOAL • Creative judgement.

SKILLS • Evaluate basic information.
• Evaluate inferences.
• Evaluate inferences/deduction.

REPRESENTATIVE ATTITUDES • We should base our judgements on reasons, we should have open minds.

Clarification and understanding

GOAL • Deep understanding and exact memory.

SKILLS • Analyse ideas.
• Analyse arguments.

REPRESENTATIVE ATTITUDES • We should seek clarity and the use of relevant information.

Decision-making

GOAL • Make well-founded decisions.

BASIC STRATEGY • Consider options, predict the consequences and choose the best option.

SKILLS • Generate ideas, clarify ideas and evaluate the reasonableness of the ideas.

Resolution of problems
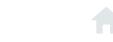
GOAL • Find the best solution.

BASIC STRATEGY • Consider possible solutions, predict the consequences and choose the bes solution.

FROM THE CONCEPTUAL MAP TO THE MIND MAP

CONCEPTUAL MAP	MIND MAP
• Start by identifying a question, field of knowledge, or topic that you want to depict.	• Use a large sheet of paper and coloured markers.
• Identify between ten and twenty relevant concepts.	• Put the main or most inclusive concept in the centre of the space of representation.
• Use post-its, lists and other real representations with objects, such as cards or blocks.	• You can use a word or picture or any other form of representation that may be useful to define this first idea.
• Organise the concepts, beginning by identifying the broadest and most inclusive in the upper part.	• Around it, place the sub-concepts or new ideas to learn, circling the main concept with no more than five or six at first.
• Then, identify different sub-concepts and place them under the main one. There should be no more than three or four.	• Use association to bring new ideas to your mind.
• Again, with more concepts, organise another line of categories on a lower level.	• Use thick lines in different colours to differentiate the relationships of each new idea to the main one.
• Return to the main question or topic, check whether new concepts arise and if the concepts on the higher tiers include those on the lower tiers.	• Link every new idea to a key word or picture which symbolises it and adds greater force.
• Use lines to join the concepts and name these lines with words that describe their relationship.	• Review the entire map at a glance and think of new associations with thinner lines for each idea until it is completed.
• Create hyperlinks between different levels of concepts and give a name to their relationship.	• The use of capitals and other ways of representing links and categories helps to enhance the map.
• Keep modifying the structure of the map until all the relationships are understood.	• Use your imagination to find and create links between ideas!

> Look for times that require the student to use different strategies embedded within the content of the curriculum

➔ Identify the strategies:
- What type of cognitive strategy did you use at that time?

- Could you have used a different one? Which one? Why?

- What is your favourite thinking strategy? Why?

- Can you invent a thinking path that will work for two challenges? For example, writing a poem and writing a short story, classifying different animals and classifying different pictures, buying a product from one brand or another, or choosing the best birthday present for a friend.

➔ Define the steps for each strategy:
- What are the steps for this strategy?

- What part did you find most difficult? Why?

- How can you improve the use of this strategy?

- What can you do if you get stuck? What has proved useful for you in the past?

➔ Create new representations:
- Can you think of a picture that shows how our mind behaves when we use this strategy?

- Can you explain what the strategy involves in your own words?

- How would you explain this strategy to a friend who does not know it but needs to use it?

- Can you think of another picture to draw on the thinking sheet that we use?

➔ Look for new content or contexts to use it:
- Think of a problem outside of school for which this strategy would be useful in solving.

- How could we improve the way that we use this strategy in class?

- Can you think of other areas where you could use this strategy?

- Have you ever used this strategy outside of class? When? How did you use it? What happened? Did it help you?

- Turn to cartography. Mind maps are a very useful educational tool for showing the semantic construction of knowledge networks. Two authors are notable for their works related to this: Joseph Novak, who developed the basics of this tool with conceptual maps and Tony Buzan, who evolved them into mind maps.
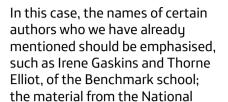
As well as these educational applications, there are specific programmes which have created guideline proposals and original thinking sheets as a systematic approach for the entire school.

4. TALKING TO LEARN HOW TO THINK

In this case, the names of certain authors who we have already mentioned should be emphasised, such as Irene Gaskins and Thorne Elliot, of the Benchmark school; the material from the National Centre for Teaching Thinking; *Making Thinking Visible*, a book by Ron Ritchhart, Mark Church and Karin Morrison, and the Philosophy for Children programme by Matthew Lipman.

TIMES	INTEGRATION OF COGNITIVE STRATEGIES IN THE LEARNING SCENARIO
At all times	• Ask students about the cognitive strategies which they use for a specific problem or challenge. You can use the suggested questions which we have seen. • Give the students time to work together on the questions in the exercise, without the teacher's intervention. • Use the graphic representations and mental maps created to guide both dialogues and the process of modelling one's thinking.
Day to day	• Set aside time to bring the entire group through filling out thinking sheets. • Start and finish the day with a brief review or with a presentation of the strategies which have shaped the thinking. • Depict these strategies in spaces dedicated to thinking in corridors, playgrounds, the library or dining hall.
In specific sessions or in a project	• Remind and explain to the students about the scaffolding or construction process of knowledge that you are following. Guide them with your words. • Create mental maps of the content to be learned. • Integrate mental maps in projects and in the inherent dynamics of each session or every section of the content. • Evaluate and qualify the use of these cognitive strategies and these maps. • Create a project aided by Bloom's taxonomy and the matrix model.
During a term or throughout the entire course	• Create your own visual organisers of cognitive strategies. • Create a map of thinking strategies in your area, department or school. • Open thinking spaces with examples from class and daily life. • Display the most original and complete mental maps and cognitive strategies on the walls of your classroom and the corridors. • Explain these activities to parents and members of the educational community, encouraging them with meetings where their use is demonstrated in practice.

What can I do in my school?

ACTION

1 **Step by step.** Learning to think is not a question of seconds. We think very quickly, without realising and at all times, but bringing thinking into classrooms requires us to act in slow motion. Test yourself first: try to identify the steps that you have followed to highlight the main ideas of a text, to compare two facts, to infer a rule or to make a decision. Remember that thinking involves cognitive strategies that can be guided and controlled. When you use one of them in the classroom, go step by step, graduate the sequence of your discourse.

"

Use pictures for thinking. What does it mean to organise ideas on a big wheel?

2 Make a mind map of your life. Do you have a new project? Are you planning holidays? Are you going to change car? Do you want to use your free time better? Whatever your decision may be, try to follow the rules in this chapter to create a mind map. Remember: use pictures, colours and your imagination to help you. Mind maps are not only for school curriculum content, they are used for many important life decisions. It is a small step from here to the classroom.

3 Depict your thinking. Use pictures to think. What does it mean to organise ideas on a big wheel? And on a pyramid or a shield? What about a bridge? Why not draw the final outcomes of a project in the form of a train or daisy? Is the picture the same for railway carriages as for a traffic jam? If thinking is learned step by step, each step can be one part of the depiction. Big wheels, windmills, houses, skyscrapers, windows, libraries… these are just some of the pictures for putting every step of thinking in its place.

4 Take a moment to think. Look for moments to integrate the cognitive strategies with the content and explicitly dedicate time to them. Learning to think improves strategy and content learning, but this does not occur in a vacuum; it is necessary to begin with processes that are guided and controlled and will be automated over time.

5 Create your thought map. By using different cognitive strategies, you will notice that many are repeated and often appear in different areas and projects. Comparing, infering, deducing, applying… are all part of the school learning scenario. Organise them on a map which you can use to show how thoughts behave when faced with different challenges. Using the map, encourage students to choose both their favourite strategies and those that they need to use most.

6 Think about the programmes. The proposals by Irene Gaskins and Thorne Elliot, the materials from the National Center for Teaching Thinking, the work of Ron Ritchhart, Mark Church and Karin Morrison, and the programme of Matthew Lipman are all complete and quite varied. Which would you like to start with? Think about it step by step and depict your decision on a thinking path or mental map.

BIBLIOGRAPHY

- **Irene GASKINS and Elliot THORNE**: *How to Teach Cognitive Strategies in School. The Benchmark Manual for Teachers.* Paidós, Barcelona, 1999.

- **David PERKINS**: *Archimedes' Bathtub: The Art and Logic of Breakthrough Thinking* Paidos, 2003.

- **Ron RITCHHART, Mark CHURCH and Karin MORRISON**: *Making Thinking Visible.* Wiley Imprint, 2011 .

- **Dan SUTCH, Tim RUDD, Keri FACER**: *Promoting Transformative Innovation in Schools.* Futurelab, 2008.

- **Robert SWARTZ** et al.: *Teaching Based Learning.* NCTT, 1998.

TO LEARN MORE

Knowledge is Power Program

www.kipp.org

This school programme is enabling thousands of students from the poorest areas in the United States to graduate from school each year and enrol in college and universities, thanks to the integration of thinking strategies and emotional and social skills throughout the curriculum. Moreover, they find support in the agreements and commitments that families, students and teachers sign together each year, or even each term.

Woorana Park Primary School in Victoria, Australia

www.woorannaparkps.vic.edu.au

Due to the development of its work in multiple intelligences, this school has organised its curriculum by focusing on students, allowing them greater autonomy in the learning process and greater participation in matters of school organisation thanks to democratic and inclusive management processes.

The School of the Future, United States

www.sof.edu

The Schools21 initiative involves the integration of skills and routines for thinking into the contents of the curriculum. As well as this preferred option, they advance the use of reflective learning portfolios, projects and programmes to stimulate intelligence.
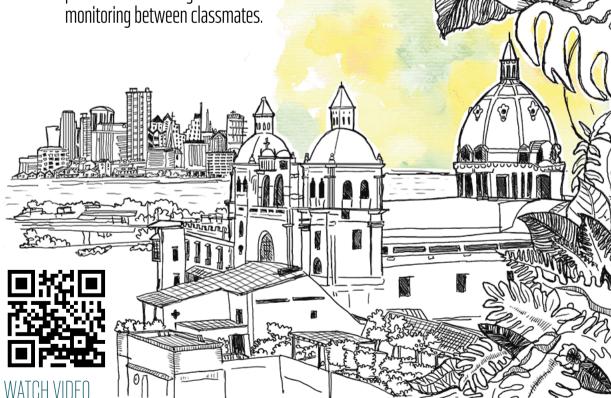
5. A COOPERATIVE RAINFOREST

⊅ Let's travel to the Colombian rainforest and discover how its small schools have created a cooperative learning experience which has spread around the world.

⊅ We'll discover how to create learning equipment, set up original roles with individual responsibilities, and produce positive interdependence in the classroom.
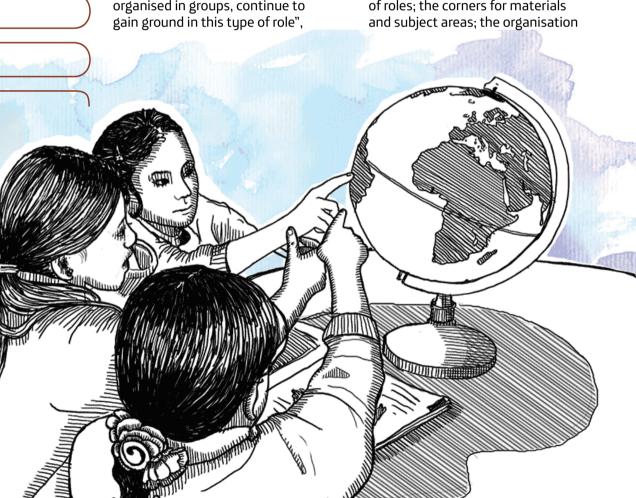
⊅ We'll analyse a model of personalised tutoring and monitoring between classmates.

WATCH VIDEO

From the coffee of the rainforest and to the new school

JOURNEY

| | Escuela Nueva is a way of being and acting in the classroom, it is also a way of organising the school, but more than anything, I would say that it is the way in which many other schools, such as my own and also many bigger ones, on the outskirts of the cities or here in the villages, have learned that by giving tools to the teachers, and allowing them to be less 'teacher' and the students, organised in groups, continue to gain ground in this type of role",

the teacher, Carlos, excitedly explains. As I listen to him, I am assailed by the images of the landscape that surrounds me, the Colombian rainforest, where nature grows according to a model of wild yet intelligent freedom.

Within the classroom, I see the circles of work that divide the school in La Cabaña. Everything is circular: the layout of the tables and sharing of roles; the corners for materials and subject areas; the organisation

> **The children are organised into cooperative groups, and each group is known by the names of different birds or plants**

of personalised time for each student, and not only during school hours. I look at Mateo at his table, concentrating on his work, far removed from our conversation thanks to the instructions given to him by Jimena.

In every corner of his school, Carlos manages to simply show that logic and nature, collaboration and growth, are parallel concepts. The children are organised into cooperative groups, and each group is given the name of a different bird or plant. From term to term, the names and roles of each group member are changed. Everyone looks after everything, but they can do it in different ways throughout the course, for example, class representatives, spokespeople, cleaners, thinkers… different roles for each name. And for each name, there is a costume inspired by nature, because there are few places in the world where there is as much biodiversity as in this forest.

The Escuela Nueva model

From its origin in Colombia and its presence throughout Latin America –Brazil, Chile, Mexico, Nicaragua, Panama, El Salvador and Peru,– Escuela Nueva has travelled to far away destinations, including East Timor, Uganda, Vietnam and the Philippines. Faced with a lack of resources, especially human resources, in areas far from population centres, and with the prevailing need to educate children of different ages, empowering the student in the role of teacher was the logical and smart answer. Like in nature, in 21ST century schools, collaborating and growing together are parallel concepts for learning better.

Escuela Nueva is the name given to the educational model and non-governmental organisation that a famous group of Colombian educators created in the eighties, in the hopes that it would be spread. Since the sixties, a team of researchers, led by Doctor Vicky Colbert, have been developing a way of being in the classroom characterised by the organisation in learning circles, the generation of roles and creation of didactic sequences that involve active participation and student autonomy. Escuela Nueva has specialised in creating a community through cooperative learning.

Currently, the Escuela Nueva model works by following three major axes to improve the school experience: communication, school management, and pedagogical attention. Vicky tells me that school management encourages the students' participation in the activity of the centre: "There are school elections each year, where the students democratically vote for their school leaders. It is an event that is celebrated with great enthusiasm and that for years has instilled a system of peaceful coexistence".
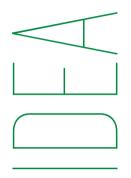
Essential components of cooperative learning

There are groups for different preferences. Cooperative learning techniques are rich and varied, but all will work while taking these seven components into account. Similarly, there are lots of possibilities for creating groups. We can create regular groups that stay together for a month or a term, or less formal groups in order to introduce, develop or complete the work for an activity. We can also create high-performance groups, whose members remain together for an entire school year and do regular target tracking of goals and individual tasks.

➲ **You have to dress up to work in a group.** But this does not mean dressing up as Spiderman or a shepherd. Don't worry, you do not have to make costumes for a festival every single day. When I talk about costumes, I am referring to the use of roles within the team. Roles such as a spokesperson, table manager, secretary, moderator or facilitator. One of the keys for successfully working in teams is that there is a fair division of tasks. Each member needs to know the jobs to be performed in the role that they occupy.

FORMAL GROUPS	INFORMAL GROUPS	HIGH-PERFORMANCE GROUPS
Students work together for one or more sessions to achieve the goals of shared learning and complete specific tasks and work together. These formal groups are the foundation of all the other cooperative processes. They are structured by means of pre-instructional decisions that establish the task and cooperative structure, supervising the groups as they work and intervening to improve the work and teamwork, evaluating the students' learning and enhancing the work of the group.	**Students work together in temporary groups for a single session to achieve goals of shared learning.** These groups are used in order to focus the students' attention on the subject, creating expectations and a frame of mind that drives learning, ensuring that students cognitively process the subject and complete an educational discussion.	**Long-term groups** (which last for at least a term or a year) with stable members whose responsibility is to offer each member the necessary support, encouragement and assistance to make academic progress and healthily develop both cognitively and socially.

> Cooperative learning techniques are rich and varied, but all will work as long as they take these seven components into account

Time is precious. Cooperative learning does not work by magic. The old custom of sending one team to do a job and waiting to see what happens a week after can knock the students' confidence. In this way, rather than learning to collaborate, they may not want to do it again. Clear didactic sequences need to be created, guides with concise times for each task that allow a project to develop in an organised way. If we return to the example of work as the end product, it is useful to assign 8, 10 or 12 minutes to tasks, during which the teams will carry out various steps and short tasks where everyone clearly understands their individual activity. For example, a didactic guide that organises the process would be: 5 minutes for reading, 12 minutes to agree on ten main ideas, 12 minutes to display them on a mind map, etc.

We all win if everyone wins. Cooperation between team members works if there is positive interdependence in the tasks. This means that they can only reach the group goals when each member achieves their own. Likewise, only when we achieve the group goal can each member complete their own task. The old musketeer saying "one for all and all for one" has greater meaning than ever.

Face to face. Do you remember the organisation of the classroom in the little La Cabaña school? Any centre which wants to enhance cooperative learning draws attention at first glance. The layout of tables and chairs in rows has disappeared; students will have to abandon such productive

EXAMPLES OF COOPERATIVE TASKS

- Make a mind map as a team.
- Compare mind maps made individually.
- Divide a text into sections, read it individually and explain each section to the rest of the class.
- Write a report or make a final presentation for the entire group.
- Explain the main ideas of a project or contents to the group.
- Generate new ideas.
- Fill in a thinking sheet in pairs.
- Highlight the outcomes at the end of a project or discussion.
- Resolve mathematical problems in pairs or as a group.
- Record and organise the main ideas of a previous discussion with the entire group.
- Use a rubric to help group members correct and grade their own work or their classmates' work.
- Present the findings of a project or discussion to another group or the entire class.
- Explain part of the contents to another classmate.

activities as reading the future on their classmates' necks or having daydreams hiding behind someone's head and exchange them for learning. They come to school, above all, to learn, and learning is more than sitting in rows daydreaming. Therefore, although sometimes there

> " The focus of attention is on our joint tasks and, therefore, the physical layout helps focus the cognitive and social willingness for understanding and cooperation

ROLE OF FACILITATOR

- Encourages participation.
- Ensures that all members participate and equally contribute their ideas and opinions.
- Mindful of controlling the time of each contribution so that everyone can speak.
- Encourages the distributions of tasks.
- Offers verbal and non-verbal support for ideas and every member's participation.
- Mediates in emotional conflicts.

ROLE OF COMPUTER

- Controls the tone of voice so that everyone speaks, so that work can be done in the classroom.
- Mindful of the time for each activity and the total time for the project.
- Controls the order of materials.
- Collects materials at the beginning and end of each task.
- Makes sure the students move between groups without making noise.
- Records frequencies and times.

ROLE OF LEADER

- In charge of explaining and sharing tasks with all members.
- Guides the work of the group and is aware of each person's roles and the work process.
- Keeps a record of the group, writes reports about group decisions and presentations.
- Checks the validity of the group's work in accordance with the instructions for each task.
- In charge of encouraging constant development and improvement in results for each task.
- Introduces or represents the group.
- Communicates in tasks with other groups.

ROLE OF THINKER

- Makes sure that everyone understands instructions. Explains or paraphrases them.
- Ensures that everyone knows how to reach the outcome of the task.
- Raises questions that encourage greater examination and thinking about every activity.
- Leads the use of cognitive strategies.
- Encourages the group to go beyond the first answer.
- Combines everyone's ideas when a common answer is needed.
- Mediates in conflicts about ideas and opinions.
- Encourages finding rationales in order to defend proposals or answers.

5. A COOPERATIVE RAINFOREST

GENERATE POSITIVE INTERDEPENDENCE, THANKS TO...

GOALS

- All students in the group must achieve a specific grade or score when they are later assessed individually.

- All students in the group must improve on, or at least maintain, their last score or grade.

- We set a standard for the result or score that the group must achieve. It can be a grade for the group as a whole, or the sum of the individual scores of each of its members.

RESOURCES

- Each group member only has one part of the required contents or resources. To finish the task, they need to cooperate.

PRIZES

- We can define a common aim that leads us to a shared prize, or even individual prizes for everyone. The rewards can be quite varied: more free or break time, time for listening to music or going to a multimedia room, organising special activities in break times, providing special game materials (such as rings, balls or video games), issuing certificates with original names or which provide credits, pins or badges, sweets, exhibitions of the best work or special trips or outings.

ROLES

- Specifying tasks for each role is only possible with cooperation among classmates. For example, recording the times of each task in a project report in which a team member watches the clock and the sequence while another notes the results.

are group presentations, the organisation of tables should put the students facing each other, focusing on the group, in a circular layout and with enough space so that the groups do not bother each other. The focus of attention is on our joint tasks and, therefore, the physical layout helps focus the cognitive and social willingness for understanding and cooperation.

⊖ Spaces and teachers also cooperate. The classroom or room where we work inspires the way that we behave and learn; we will talk about the design of spaces later, but it is not necessary to undertake massive renovations to make classes a cooperative space. Classroom walls can speak, and will do so constructively when we make use of its many corners, noticeboards or spaces where we can display completed works, duties of our roles, the didactic sequence of discussions or different resources needed. For example, you can move the groups to thematic areas within the classroom itself, with an activity in each space, or even create a cooperative space which encourages teamwork. At the same time, the teacher moves between tables, sharing feedback among the groups, cooperating with their members, being mindful of the didactic sequences of the activities that they coordinate and, especially, observing what happens while giving meaning to our last criteria.

⊖ Evaluate, evaluate, evaluate. Cooperative learning will get the students involved in the task, increase their motivation, and show improvements in the products of their learning. However, aside from the content, we must dedicate part of the assessment to the interactions that will have developed during the work. Summaries of the duties of each role, the use of rubrics, trust in the approaches of self-assessment

> " When assessment criteria are shared, you learn with greater levels of understanding and acquire more sustainable habits

COOPERATIVE CLASSROOM LAYOUT CONTRIBUTES WHEN...

- The members of each group are sitting together and can work facing each other.

- Everyone can see the teacher without having to turn around or move tables and chairs.

- There is space between the groups, so that the teacher and other classmates can move between them and stop to participate and cooperate.

- Signs or presentations are created which show what each role consists of.

- Posters and mind maps are displayed in the class and in the school, on which multiple intelligence model activities are linked with cognitive strategies and the roles of cooperative learning.

- The students' group work is displayed in corridors and within the classroom, thus creating cooperative exhibitions.

- There is not a single point of reference to go to in order to talk to the teacher, as they move between groups and around the class, paying attention to what is happening in each group.

THE TEACHER, IN THE COOPERATIVE LEARNING SCENARIO...

- Watches and pays attention to how each group is working.

- Specifies the didactic sequence of activities and the options to choose activities in a specific order or project.

- Moves between groups and tables, is attentive to conversations and the development of the product or findings of each task.

- Is very attentive to times and monitoring each group according to the timing of the project.

- Frequently introduces and applies the duties of each role and the graphic elements related to cooperative learning that is expounded in the classroom.

- Makes available the material and resources required for the development of the session.

- Encourages the groups to focus on the task and actively participate in achieving their goals.

- Is attentive to individual roles and their fulfilment.

and peer-evaluation between classmates are optimal strategies for learning to work as a team. A percentage of grades should be dedicated to social skills which have been put into practice. They learn with greater levels of understanding

and acquire skills which are more sustainable in the long term when the assessment criteria is shared with students from the beginning, and a comprehensive scale of all their grades is made. Interpersonal intelligence is also to be graded.

5. A COOPERATIVE RAINFOREST

My evaluation
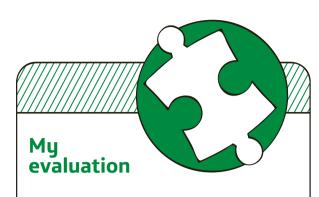
I have fulfilled the duties of the role which was given to me.

| 1 | 2 | 3 | 4 |

I have actively contributed with my ideas and opinions.

| 1 | 2 | 3 | 4 |

I have attentively listened to the ideas and opinions of the others.

| 1 | 2 | 3 | 4 |

I have respected the distribution of tasks.

| 1 | 2 | 3 | 4 |

TI clearly understood the goal of each activity.

| 1 | 2 | 3 | 4 |

I have maintained order in the group tasks.

| 1 | 2 | 3 | 4 |

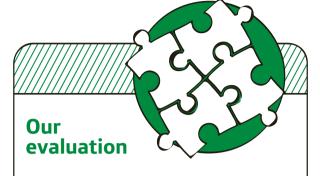I have used a tone of voice allowing all of us to work in the same classroom.

| 1 | 2 | 3 | 4 |

I have been aware of the state of mind of my classmates.

| 1 | 2 | 3 | 4 |

I have actively contributed to the group's objectives.

| 1 | 2 | 3 | 4 |

Our evaluation

We have listened to the opinions and ideas of all the members of the group.

| 1 | 2 | 3 | 4 |

We have fulfilled our roles.

| 1 | 2 | 3 | 4 |

We clearly understood the purpose of each task.

| 1 | 2 | 3 | 4 |

We have managed to work as a coordinated group.

| 1 | 2 | 3 | 4 |

We have been aware of the time.

| 1 | 2 | 3 | 4 |

We have maintained an order which has made the work easier.

| 1 | 2 | 3 | 4 |

We have taken part in an orderly manner without talking over each other, taking turns.

| 1 | 2 | 3 | 4 |

Our tone of voice has allowed all the groups in the classroom to work.

| 1 | 2 | 3 | 4 |

The group relationships and the emotional climate are good.

| 1 | 2 | 3 | 4 |

We have taken part with the teacher when it was necessary.

| 1 | 2 | 3 | 4 |

METHOD

Interpreting to learn

We could design the role of the thinker-owl, as well as the leader-lion, organiser-turtle and facilitator-parrot. You can invent new roles with historical figures: think of Alphonse X the Wise, Napoleon, Ferdinand VII or the Queen Regent Maria Cristina, for example. Can you guess who is best for each role? Invent your own names. In the little La Cabaña school, they created roles inspired by nature, but the world of superheroes, football, cinema, literature or music are also sources of inspiration with great possibilities for creating original roles. Conversely, for the roles to make sense, students and teachers must collaborate in the process of creating them and be aware of their needs. In this process, different techniques can help us:

⊙ You can start by putting the students in cooperative groups without giving them roles, and planning simple didactic sequences in which they work in pairs or as a group.

⊙ After a few sessions, raise questions about how to improve working in groups.

> **"**
>
> Superheroes,
> cinema,
> literature
> and music
> all represent
> sources of
> inspiration
> for creating
> original roles

RODIN'S THINKER

HOW DO YOU SAY?

- Let's further clarify this point.
- Why don't we look further into this idea?
- What do we want to say here?
- What exactly does this concept mean?
- How could we explain it in other words?
- Let's look at a specific example.
- What evidence is our answer based on?
- Let's focus on this part...

HOW IS IT EXPRESSED?

- Visual contact with the task.
- Moving both hands in circular motions.
- Moving just one hand to encourage a member to intervene.
- Creating visual displays of concepts.
- Drawing or depicting sequences of ideas.
- Using mind maps.
- Signalling the key ideas of the material.
- Joining your two hands and pointing towards the table or workplace to focus the action in each task.

there will soon be suggestions with various skills that can be organised into categories.

→ Complete these categories with your students and set the meaning of the role and its interpretation.

→ Start by assigning roles with simple skills.

→ Introduce the roles step by step. You can start with the simplest ones, introducing them step by step. It is also useful to introduce them all at once, but to then add skills.

→ When a conflict arises within the group work, pitch the dialogue to all the students, and skills that resolve or avoid this type of conflict are deepened. You can

examine each role with the aim of improving it.

→ Look for other ways to create the need for understanding and interpreting of cooperative roles. For example, describe an activity and question how they can work as a team to solve it. Create diagrams or timelines in which you show the didactic sequence of each discussion. This way, students can work with greater autonomy without the entire rhythm of the class being steered by the teacher. Create a work schedule to be completed and some shared goals for each group. The teacher will help everyone to reach them, but each student will be responsible for their own commitment and the group's goals. The teacher helps, advises and

> The role of the tutor also changes, adjusting to the needs of the relationship and regulating the scaffolding process

guides the students during the process, but the responsibility of learning lies in the students' role. Use the Sydney matrix or multiple intelligence palette from Barcelona to help you.

- Once the roles are completely shown, you can create original names to identify them and help the students to recognise them and use them in their interpretation.

- Frequently rotate the roles so that each group member develops all the skills.

- Clearly explain the skills required for each role. Use posters or cards that students can have to hand and where the type of behaviours and most common phrases for each role are recognised.

- Demonstrate each role with your own conduct and remark on the behaviour and non-verbal cues that you observe among the students, to compliment them on their interpretation. Look for good examples and discuss them aloud.

- Offer forms of feedback: create rubrics of these skills with which the students can assess their performance before changing roles. Encourage the conscious interpretation of each role with repeated practice and assessment.

One by one

In peer tutoring, the responsibility and commitment of the student-tutor towards their classmates requires them to devote their time and focus to the specific content, activity or problem to be resolved.

We all learn thanks to models. Whether a teacher or a classmate, each student needs a representative figure as a reflection of themselves to discover their own identity, both through their similarities and their differences. Learning is a social experience.

In this way, the orientation given to the student-tutor is done via guidelines that allow his/her conduct to be regulated, as well as helpful indications that become ever more specific to the classmate and are very useful as supports. The role of the student-tutor, or the role of the teacher when working with a student individually, can also change, adjusting to the needs of the relationship and regulating the scaffolding process. By tutoring in this way, we can build various types of roles aided by two variables which describe the profile of the student being tutored: one that indicates the level of competency and another that shows the level of motivation. This way, we create four types of roles in which the student-tutor finds support in order to guide the timely intervention by pairs or peer tutoring, and which become more routine with time.

LEVEL OF COMPETENCE AND MOTIVATION IN THE CLASSROOM

→ GREATER MOTIVATION

↑ HIGHER COMPETENCY

TUTOR OF INSPIRATION

With competent, but unmotivated students:

- Look to awaken interest and motivation for the task.
- Focus on more practical examples and cases to show the contents in daily life or in other projects and school subjects.
- Emphasise positive rewards in short periods of time.
- Ask about the lack of connection with the contents and explore possible solutions.
- Use puzzles and games related to the contents.

TUTOR *COACH*

With competent, and highly motivated students:

- Allow them freedom to experiment and make mistakes.
- Present difficult content and problems to introduce new challenges.
- Keep their interest by asking questions related to the content and the most interesting elements or their favourite parts.
- Encourage them to be tutors for their classmates.
- Promote reflective moments about the nature of the contents and their uses.

TUTOR MANAGER

With students with low levels of competency and little motivation:

- Set simple concrete goals, with short response times.
- Organise very guided sequences with regular rewards.
- Maintain close monitoring and contact.
- Depict progress graphically.
- Look for very specific examples of the daily uses of the contents.
- The same exercises can be repeated more than once.
- It is about building relationships with strategies in other areas where there is greater competency or greater motivation.

TUTOR GUIDE

With students with low levels of competency but high motivation:

- Visualise the future when the learning goals will have been reached.
- Work much faster by focusing on the increasing difficulty of tasks.
- Offer more tasks and activities so they can repeat them and do them on their own.
- Stress cognitive strategies for solving problems or content and its graphic representation.
- Strengthen motivation with medium and long-term goals and rewards.

What can I do in my school?

ACTION

1 Start by making costumes. Create well-defined roles with clear functions according to specific issues and tasks that the students can develop in order to improve harmony and work in the classroom. Keeping resources organised and maintaining an acceptable voice level, taking a roll call or helping with materials, enlivening tasks, sticking to times and gathering conclusions, are all habits that everyone can share. Be imaginative, try inventing superhero names for the older students, or simply, animal names for the younger students. Create eye-catching murals that show the functions and significance of each role.

2 Informal groups. Create occasions for working in teams, with moments to share in informal groups. Suggest cooperative activities which may last a few minutes per class, such as introducing what we know about the new topic, answering questions in pairs, or gathering the main learning outcomes at the end of a discussion.
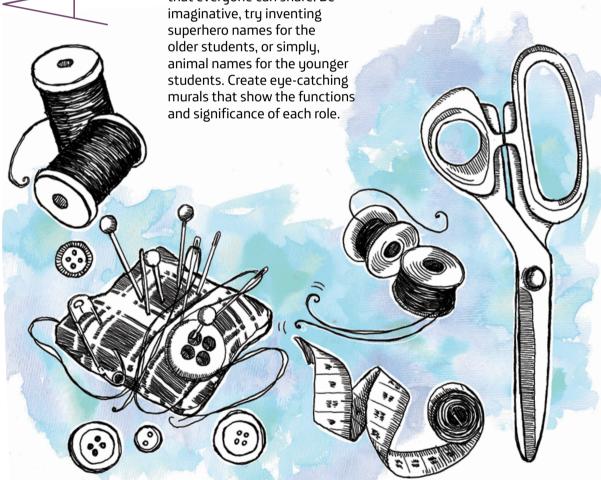
> Join in by creating units with older students to teach in the classrooms of the younger classes

3 Make a puzzle. Puzzles are an easy technique for cooperative learning. Start by dividing the class into groups with the same number of members, and then, divide the contents into as many parts as there are members in each group. Every group member will be a specialist in one area of the content, and these specialists will join in new groups to work on the part of the content that they specialise in. Later, each specialist will return to their original group in order to show, share and teach the material produced with their group.

4 When the student is the teacher, they learn twice as much. Join in by creating units with older students to teach in the classrooms of the younger classes. You can build from a volunteer programme in the afternoon, to term support during school hours, or even projects. The oldest ones can also create working sessions, in a field that they are qualified in, such as class work. This can later be put into practice in the classroom with the youngest children: educational board games, overview materials or handouts and posters, concept maps...

5 Create active circles, cooperate in the space. Remove rows of tables, if you have already created roles and small cooperative spaces, it is time to make a qualitative leap. Arrange your students in circles and try to create spaces with materials and posters organised around different areas and topics. Not only in classrooms, make use of the corridors and offices for meetings and the staff room.

6 Interpersonal intelligence is to be graded. Evaluating the behaviours and social habits that are being developed in the group is of utmost importance in creating a cooperative culture in the school. Use a rubric to help explain the four or five indicators involved in teamwork, and share them with your students. How much of the grade will go towards these indicators? Start with your class and collaborate with other teachers using shared rubrics which the whole school can understand and use in their classes. Now, give it a logo: you have created your own cooperative learning programme. You are on the road to becoming part of school21.

BIBLIOGRAPHY

- **Paul Hamlyn Foundation**: *A Vision for Engaging Schools.* Learning futures, 2012.

- **Valerie HANNON, Sarah GILLINSON** and **Leonie SHANKS**: *Learning a Living. Radical Innovation in Education for Work.* Bloomsbury Qatar Foundation, 2013.

- **Kieron KIRKLAND** and **Dan SUTCH**: *Overcoming the Barriers to Educational Innovation.* Futurelab, 2009.

- **David W. JOHNSON, Roger T. JOHNSON** and **Edythe J. HOLUBEC** [ed.]: *Cooperative Learning in the Classroom (Spanish ed.).* Paidós, Buenos Aires, 1999.

- **David PERKINS**: *Making Learning Whole.* Jossey-Bass, 2010.

- **UNESCO**: *Hacia las sociedades del conocimiento.* Ediciones UNESCO, 2005.

- **Ben WILLIAMSON, Sarah PAYTON**: *Curriculum and Teaching Innovation. Transforming Classroom Practice and Personalisation.* Futurelab, 2009.

TO LEARN MORE

Fundación Escuela Nueva

www.escuelanueva.org

Escuela Nueva is a model of pedagogical organisation, communication and school management that is recognised for the participation of its students in the activity of their centre and the work they do in the classroom, which takes place in active circles of cooperative learning through the support and collaboration between classmates. From its origin in Colombia and its presence throughout Latin America – Brazil, Chile, Mexico, Nicaragua, Panama, El Salvador and Peru,– the Escuela Nueva has travelled to far away destinations, including East Timor, Uganda, Vietnam and the Philippines. Faced with a lack of resources, especially human resources, in areas far from active population centres, and with the prevailing need to educate children of different ages. needs and realities, empowering the student in the role of teacher and the companion of his/her classmates was the logical and smart answer.

Rochester School in Bogotá, Colombia

www.rochester.edu.co

The Rochester school is a centre located in the mountains on the outskirts of Bogotá and is perfectly integrated into nature and its surroundings. Over the years, a powerful model of an ecological school has been developed, but what is more, all its classes, structures and corridors are circular, promoting community decisions and cooperative learning in classrooms at all times. Moreover, it is one of the international references for the application of William Glasser's psychological theory.

Cooperative Multitasking Classroom, in the Colegio Padre Piquer in Madrid

www.padrepiquer.es

The cooperative multitasking classroom is an initiative where social and academic inclusion take place without any type of internal barriers, where students work individually or in groups on different projects in subject modules, organising themselves in different work spaces. These spaces are characterised by how they multi-task by combining different methodologies: teacher-led explanations, individual work, cooperative work, individualised tutoring and guidance and an in-class library. This layout promotes the communication between teachers and students, and within the group of students. There is also a glassed-in area which the students use as a resource centre.

6. PROJECTS THAT REVOLUTIONISED SCHOOLS

⊘ Let's travel to Bogotá.

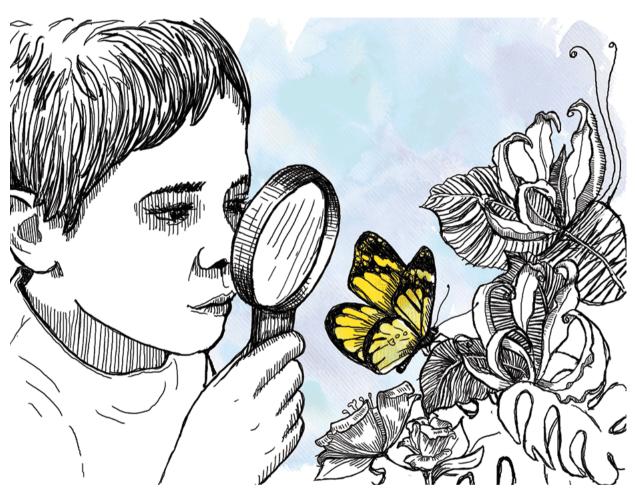⊘ We'll discover the features and process of project-based learning.

⊘ We learn how to plan projects that combine everything that we have learned in previous chapters, helped by practical advice of teachers at the world's most innovative centres.

⊘ We know the main schools and most important educational movements in order to continue improving within this ground-breaking methodology.

WATCH VIDEO

Learning against the odds

JOURNEY

The aims of the Asociación Alianza Educativa (Educational Alliance Association) of Colombia are set on the high expectations of its students. This means it makes no difference where they are from; what is important is the mutually shared effort to make their projects a reality. In Alianza Educativa schools, nine out of ten students complete secondary education. This is the success dreamed of by a country where over half of its students do not gain access to higher education. This is a statistic that implies great socio-economic handicaps.

Over twelve years ago, a team of teachers and principals from private schools in San Carlos, Nueva Granada and Los Nogales, supported by the Universidad de los Andes, decided to participate in the opening of numerous schools in the poorest areas of Bogotá. To give us an idea of this format, the Colombian licensing system resembles what is understood as subsidised public education in Spain, although there are differences.

In this way, the private centres developed by Alianza Educativa obtained the licence to run five public schools located in the poorest peripheral areas of Bogotá. Alianza Educativa is an experiment which shows that, by making appropriate decisions, it is possible to achieve quality in innovation; decisions that do not depend so much on quantitative elements (such as physical and economic resources, as these five public schools have resources equal to those in any other school), but rather qualitative changes, the benchmarks of the methodology followed day in and day out in the classroom.

Life in Alianza Educativa classrooms

> In the first-year classes, the youngest students move around the herb garden and categorise the parts of each plant

Walking through the classrooms in the Alianza Educativa schools is an experience of glorious dialogue. It is summer and, in the first-year classes, the youngest students move around the herb garden and categorise the parts of each plant. They are well looked after and happily flourish, each in their own way, in transparent pots. A group of students are working hard to care for the species allocated to them; they have completed the diagram with the parts of the plant and have moved on to another question. The following week, they have to present a product related to the main properties of their plant. They are all typical of Colombia. Right now, they are debating whether to decide on a medicinal tea, a cosmetic, a perfume or the stuffing for a new type of pillow, which fulfils all the above conditions: a cushion heated in the microwave to aid muscle pain, smells good and has nourishing properties for the skin. On seeing their campaign outline, I feel that they will lose money if they do not immediately market their invention. In fact, I am not the only one interested in stealing the idea: beside them, a group watches them closely. They have no idea what to do with their plant, but a cactus is definitely not going to be useful for cushions...

In the physical education rooms, the large end-of-year festival is being planned. It is a musical in which each group of students has a specific role to interpret. Each course covers one subject area so it all works to perfection. From dancing, we move on to combustion. In the classroom next door, the students work on understanding engines and generating energy. A week ago, the class split into groups and they disassembled an engine into parts. Each group was in charge of one of these parts, whose explanatory diagrams are now on the walls. Today, helped by Lego Education models, they are building their own electronic engine. The model must be able to drag a structure that the teacher lifts from their table with difficulty. I wonder how the weak plastic pieces will be able to move such a weighty structure. "The pulleys", I am told softly by a girl in the group at the back, "you have to use various sizes and combinations of pulleys". I do not think that I have ever seen such means and such ingenious ways of making such a small engine. "It will be able to drag a structure ten times heavier than its own weight", the teacher reminds me.
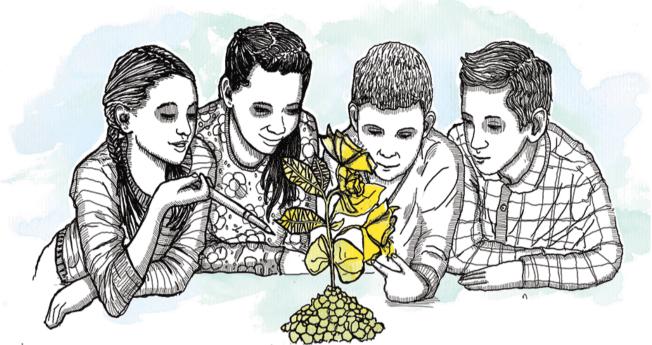
IDEA

What is project-based learning?

Project-based learning (PBL) is an educational methodology that integrates curricular content with problems and challenges based on real experiences and practices in the world, the school environment and daily life. This methodology is developed following a specific didactic sequence in the form of a project, planned in advance by the teachers; the students play the main role, actively working in teams. It all culminates with the final presentation of a product, although continuous assessment has been present throughout the process.

PBL is a methodology which places the student at the centre of their own learning, enabling them to face challenges, solve problems and work with their classmates in an autonomous, but organised, environment, with a teacher assessing and evaluating during the entire project.

The methodology of project-based learning is a key feature of every school21. All around the world, school initiatives such as:
http://www.bigpicture.org,
http://www.newtechnetwork.org,
http://www.envisionschools.org,
http://studioschoolstrust.org
and http://www.hightechhigh.org
are good proof of this method.

In the development of a project, the content and aim can come from one or more subjects. In fact, as it occurs in reality, when you choose a project based on real and practical situations, information and problems are not perfectly compartmentalised, but require analysis and integration.

The story of PBL

The PBL method is characterised by a number of qualities and a specific didactic sequence that defines it. This sequence is not a closed scheme, but it guarantees that activities occur coherently, helping us to prioritise and structure classroom practices.

Design

Introduction to the challenge and the context.

Presentation of the final product that will be created and its characteristics.

Connection to the curricular contents.

Presentation of the process and tools, and assessment criteria.

Organisation of groups and roles.

Time-frames.

Initial analysis and processing of information.

Research and syntheses of available information and resources.

Organisation of information: concept maps, murals…

Creation

Development of hypotheses or design of the rough drafts and prototypes of the product.

Decisions about the personalisation of the product.

Preparation of daily work.

Planning a multiple intelligence palette.

Monitoring by teachers and written tests.
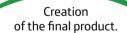
Advisement from teachers on products.

New organisation and synthesis of information.

Integration of cognitive strategies.

Improvement or creation of new prototypes.

Peer-evaluation among students.

Display

Creation of the final product.

Final practical exercises or product experiments.

Preparation of the display.

Development of the display.
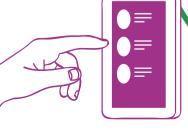
Final assessment of the product.

Self-assessment.

Evaluation of the entire process and feedback on phases.

Launching the display/exhibition/presentation and generation of new dynamics to link them to other activities in the educational project.

Plan your project

METHOD

⊘ Start with passion:

- It is easier to begin developing a project from a stimulating idea. For example, whatever may connect with what Ken Robinson described as "the element": your passion; what motivates you and gives meaning to your personal project.

- Use the following questions to try to find inspiration:
  a. What are the most obvious and practical applications of your subject in relation to everyday life?
  b. Where do you find these applications in the world around you? And in the media or your school environment?
  c. What brought you to these studies?
  d. What do you like most about being a teacher of this subject?

- Try to find inspiration in comments that students make in the classroom about what they like about your material. Maybe one of them commented on something in a previous class that could give you an idea...

- Your departmental colleagues can also help spark the project. Try to ask them the same questions you asked yourself.

- Your way of motivating yourself may start you thinking about the final outcome, a challenge or a problem. Try to begin with any of the three; the most important thing is that the project connects, first and foremost, with you.

- Go outside, take a walk, visit a museum, watch a film, listen to music... somewhere there is an idea for creating a project to show the content of your subject as a vital part of the world.

⊘ Connect your passion to the curriculum:

- In what areas, aims or contents of the curriculum is this idea most clearly found?

- Take your curriculum and underline the aims, content, and assessment criteria that you want to use in relation to your idea.

- Arrange the parts that you have highlighted in a concept map.

- Try to paraphrase them in your own words, start by asking yourself:
  a. What do I want the students to understand? These are the comprehension goals, the aims.
  b. What are the topics that will be connective threads in the project? In this instance, they help us with contents.
  c. How will students' understanding be shown? Thanks to the assessment criteria. Practical help: the assessment criteria are the best triggers for project planning and can guide the formulation of more specific aims and goals. In the next chapter, we will examine in greater detail the assessment that is characteristic of schools21.

PROJECT-BASED LEARNING

1 Starting point
- Main subject
- Initial question
- What we know

Exchange of ideas

2 Formation of teams

3 Definition of the final product
- Definition of goals

Transversality

4 Organisation and planning
- Assignment of roles
- Definition of tasks and times

Creativity

5 Compilation of information
- Review of goals
- Recovery of previous knowledge
- Introduction of new concepts
- Search for information

6 Analysis and synthesis
- Idea-sharing
- Resolution of problems
- Decision-making

Collaboration

7 Production
- Application of new knowledge
- Implementation of basic skills
- Development and execution of final product

8 Presentation of the project
- Preparation
- Defence
- Review with experts

9 Collective response to the initial question
- Reflection on the experience
- Use of instant messaging systems

10 Evaluation and self-evaluation

Significant learning

> Go outside,
> take a walk,
> visit a museum,
> watch a film,
> listen to music...
> somewhere
> there is an idea
> for creating
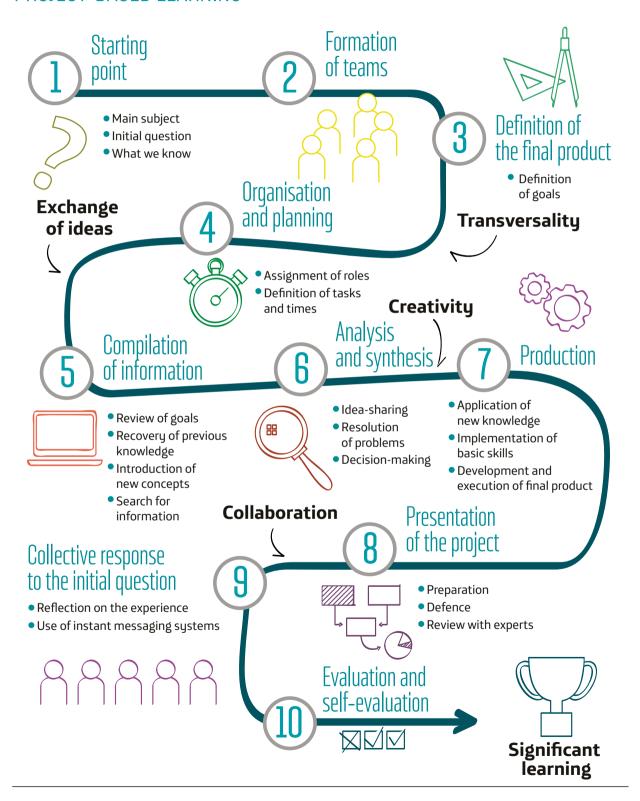> a project

- Formulate the core topic, the title that will guide the project, in just one sentence. Try something direct and descriptive, but catchy.

➡ **Invent the challenge and a product:**

- Start by thinking about the introduction to the project. What story will you present to your students?
  a. Will this challenge or problem motivate my students?
  b. Do you have a proposal?
  c. It is realistic?
  d. Is it compelling?
  e. Does this project motivate me?
  f. Due to the close connection between the project and reality, can I invite external experts to participate in it?
  g. Between us, do we know of any student's parents or other community members who work professionally in the field of the project and who could collaborate? What roles could we assign them?

- Think of a core question that is especially motivating and forms part of this challenge. A good question for the 21ST century is one with an answer that cannot be 'googled'.

- In terms of the link between the challenge and the curriculum's content, you can think of questions to help you demonstrate its suitability:
  a. Does the relationship between the challenge and the curriculum make sense?
  b. Through this challenge, will they understand all the elements of the curriculum that you highlighted?
  c. What do you need to add to or remove from the challenge?

- It is also necessary at this early stage to think about the final product that you will present. What is the final product?
  a. Is it similar for everyone, but versatile?
  b. Is it a product that students can personalise?
  c. Does the product solve or appropriately relate to the original challenge?
  d. What assessment criteria does the product itself focus on? How do you guarantee that students will understand and learn?
  e. Is there any way to display it or present it in public?

- If you already have a clear idea about the challenge and the product, you can think about the features of the public presentation of the display. With restraint and in accordance with the characteristics of the project, recognise that the more open the invitation and the greater the possibility of exhibiting the products, the greater the responsibility generated in the learning process and the richer the learning community will be.
  a. Who will be able to attend?
  b. What role will the guests have in the assessment?
  c. What tools will we use to assess the product in the display? And the guests?
  d. Where and when will it take place?
  e. Once completed, can the products remain on display in a permanent exhibition?
  f. What other educational or cultural uses can an exhibition have?
  g. Are there any institutions or organisations that can collaborate in the process?

> **Share the project with your colleagues:**

- Whether you got here individually or working in conjunction with other teachers, it is rewarding to open these ideas to criticism from other colleagues. In this way, the teaching staff can ask themselves the same questions that have guided your creation process until this moment. It is important to bear in mind that assessment sessions between teachers are not moments of categorisation between two groups, what is "good" and what is "bad", but rather all questions raised can garner a wide range of answers and nuances. In fact, in practice, it is usual for certain issues to become worse so that others can be improved. In any event, presenting the project to your colleagues and noting their suggestions in each section described is a unique way of learning in order to grow as educators, including our improvement and resulting satisfaction. Moreover, a culture of qualitative and constructive evaluation among teachers is the best way to create a learning community that is more sensitive to the development of students' progress.

- Aside from jointly responding to many of the questions listed here, there are other tools that will enrich a project with more colleagues. For example, you can build your own scale, following Adria Steinberg's six-point scale in order to evaluate the quality of a project. Steinberg identified six elements for the functioning of a project within the classroom:
  a. Authenticity: it must have a link to the real world, problem or context with a meaning in the students' world, and a real final product with social value.
  b. Academic rigour: the skills to be developed and their relationship with the subjects and contents to be covered should be clear.
  c. Applied learning: consists of 21ST century skills, such as being capable of learning how to learn, social and civic abilities, digital competence and the ability to process information, and having personal autonomy and initiative.
  d. Active exploration: it includes periods of research and practical exercises involving the problem, so that the students will experiment.
  e. Relating with adults: the project is linked to the community and the world around them, and the adults who may participate in the process.
  f. Assessment: assessment tools should be clear throughout the entire process, in order to inform the students and be clear about the value of each phase of the final assessment.

- A common practice for sharing the project with peers is the construction of a scale with a ruler from 1 to 4 or 1 to 6, in order to grade each of these six elements. The teaching staff can use this scale when contributing to the improvement of projects that are presented and to create new ones.

- Remember that the most important thing is not whether the project is good or bad, but rather the way that your colleagues' comments help you to improve the work performed until that point; as we saw in the previous chapter, learning works better "in collaboration". After sharing, it makes sense to reshape many of your initial notes, which means that the project and our work in the classroom is improving.

> **A good question for the 21ST century is one with an answer that cannot be 'googled'**

What can I do in my school?

ACTION

1 **Discover the beauty of the curriculum.** What was your favourite subject in school? Why? What was it that you liked most? And now? Look for the creativity and beauty of human knowledge in your field. Go directly to the source: the contents of the curriculum. What cultural creations are there because of this knowledge? What wonders, products, inventions or discoveries stand out most? Bring them frequently to the layout of your learning experiences, to the projects, and show them to students. If you want to awaken passion, let them learn of your own passion for the beauty of the curricular contents.

"

Design learning experiments in which you are the first to enjoy learning

2

Share the focus of your interest. It may be language and that you love ICT, or maths and that you are passionate about programming. If you are going to create new learning projects and experiments, start by connecting with your own likes and passions. Design learning experiments in which you are the first to enjoy learning. Learn as you teach: the most efficient way to teach is when you learn together with your students in each new learning scenario.

3

Connect realities. History is art and literature, biology is physics and chemistry, computer science is maths and language, language is communication in native and foreign tongues... Reality is not compartmentalised and nor will the future of our students be. Discover the beauty of the curriculum with the help of a colleague. The didactic sequence of PBL stimulates the integration of contents from different curriculum areas. Start by planning for a project in pairs with the help of another teacher; you will find it much easier.

4

Arrange an educational display. Make it with the products from the projects or with the documents that show their development, with educational posters about every subject or with the educational project itself, or with work from any subject, to show that the educational project is alive in the daily activity of the centre. Redesign your school as an exhibition space for your identity and as effective proof of the learning process. And, incidentally, the curators are teachers, and the guides are the students themselves, explaining their learning.

5

Chapter by chapter, increase and integrate learning. Plan with a multiple intelligence palette, and later, integrate cognitive strategies, aided by Bloom's taxonomy. Add a challenge that gives meaning to the programme, a product to present at the end which describes various activities, and try to be very attentive to cooperative work. What is the outcome? You have created a project.

BIBLIOGRAPHY

- **Brigid BARRON, Linda DARLING-HAMMOND**: *Teaching for Meaningful Learning. A Review of Research of Inquiry-Based and Cooperative Learning, in Powerful Learning: What We Know about Teaching for Understanding.* John Wiley, 2008.

- **Buck Institute for Education**: *PBL Starter Kit*, BIE 2010.

- **John LARMER, John R. MERGENDOLLER**: *7 Essentials for Project-Based Learning, in: Educational Leadership.* ASCD, March 2012.

- **OECD**: *21st Century Skills and Competences for New Millennium Learners in OECD Countries.* OECD Publishing, 2010.

- **Partnership for 21st Century Skills**: *P21 Common Core Toolkit. A Guide to Aligning the Common Core State Standards with the Framework for 21st Century Skills.* Partnership for 21st Century Skills, 2011.

TO LEARN MORE

Studio Schools in the United Kingdom

www.studioschoolstrust.org

Schools which have become professional studios for new technologies, music, design, laboratories, biology, research, writing, physics and chemistry, organising the curriculum around project-based learning and changing the school structure, schedule and times.

The Met Center in Providence, United States

www.metcenter.org

Schools designed as subject and project studio centres which allow students to develop the curriculum from their areas of interest and create dynamics with greater participation where the responsibility of learning and assessment is shared between them.

Matthew Moss High School in Rochdale, England

www.mmhs.co.uk

In the Matthew Moss High School in Rochdale, England, from the first course, secondary students are encouraged to connect with their passions. To do this, they take part in a programme called My World, where they choose what projects they want to carry out, driven by their own likes and interests. The programme is organised utilising the time of eight standard classes, which allows students to design their projects during the school day, four days per week.

7. AUTHENTIC ASSESSMENT

⊙ Let's travel to San Diego in California, USA.

⊙ We'll learn of a diverse range of assessment tools and their characteristics, in order to enrich our educational practice.

WATCH VIDEO

Overwhelming creativity

JOURNEY

The west coast of the United States has a wealth of waves, films, strawberries and technology. California is one of the richest and most prosperous regions in the world. Upon visiting High Tech High in San Diego, it is hard to know whether you are in a school or have perhaps made a mistake and landed in Silicon Valley. Finding a teacher to accompany you proves to be a difficult task; they are all involved in projects, advising their students. Rather than a teacher, it is the students themselves who will tell you what they do, as a large part of their work they've chosen according their own interests.

However, no matter how many explanations you receive, I do not know if you will get over your amazement on finding out, for example, the uses of a robot that moves on four wheels and which, humorously and clumsily, follows a yellow line drawn on the ground dragging a bundle of logs.

In another class, various groups of children are building cardboard prototypes. All the prototypes are different, although, at first glance, they seem to be bridges. During this construction, two girls enter the class carrying as best they can, two ten kilo weights each. The weights are thin and round, reminiscent of the large metal doughnuts that strongmen lift in the gym. The two carriers are part of one of the groups, which has built an oblong model from cardboard which hangs suspended between two tables. The bridge seems stable in the eyes of a child, who, lying on the floor under the model, is busy making the final touches. However, it is not safe enough to stay there watching while the weights are being placed on the construction.

The bridge has been baptised in pen as Prototype number 3. Very carefully, the two students place the hundred kilos on top. First one weight, suspense. Then another. The bridge resists for a second, two, three… The expectant faces of the team are just starting to break into smiles when, after five seconds, the bridge falls apart onto a mat. The good one will have to be Prototype number 4. The teacher applauds and the group gets busy picking up the pieces. Everyone looks curiously at the debris of the disaster; if only the cardboard pieces could talk! Later, they turn their attention back to their initial plans. What could have failed?

From one end of the school to the other, students and teachers can be seen creating and sharing work equally. If not for the age difference, it would be impossible to guess who is who. Looking strictly at their behaviour, they cannot be distinguished. They are all equally motivated and active in the development of their projects.

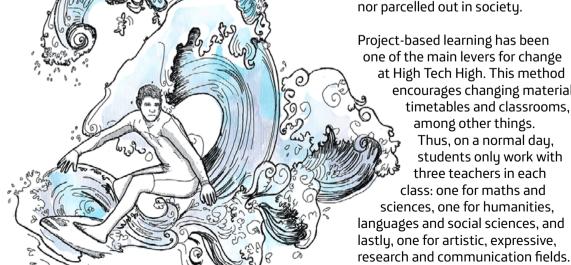# Hands and minds full of reality and creativity

" From one end of the school to the other, students and teachers can be seen creating and sharing work equally

The High Tech High project has spread to another eleven other high schools in the United States. The results speak for themselves. Thanks to this model, one hundred percent of the students have passed post-compulsory secondary education. This is a very positive statistic, but even more so when it is examined in depth. Forty percent of these schools belong to the most disadvantaged social classes in the area. For many families, these students are the first generation who successfully managed to complete the necessary studies to enrol in university.

The management team and teachers are certain of three key assumptions that drive many of their decisions about the project-based learning model. Firstly, the mind and hands play a role in learning, that is, thought and practice should be combined. Secondly, reality should be found within school rather than outside, and must be visible in relation to everything that happens in the classroom.

Finally, classes and schedules are not conceived as closed subjects and organised into groups of different levels of difficulty; rather the philosophy of curricular coordination aims to connect content, people and reality. Therefore, subjects and schedules are organised around two basic criteria: the relationship and proximity of the contents, in accordance with the projects being developed, and the integration of all students in the classroom. Life itself is to be found within the school, and nor is it fragmented into knowledge nor parcelled out in society.

Project-based learning has been one of the main levers for change at High Tech High. This method encourages changing material, timetables and classrooms, among other things. Thus, on a normal day, students only work with three teachers in each class: one for maths and sciences, one for humanities, languages and social sciences, and lastly, one for artistic, expressive, research and communication fields.

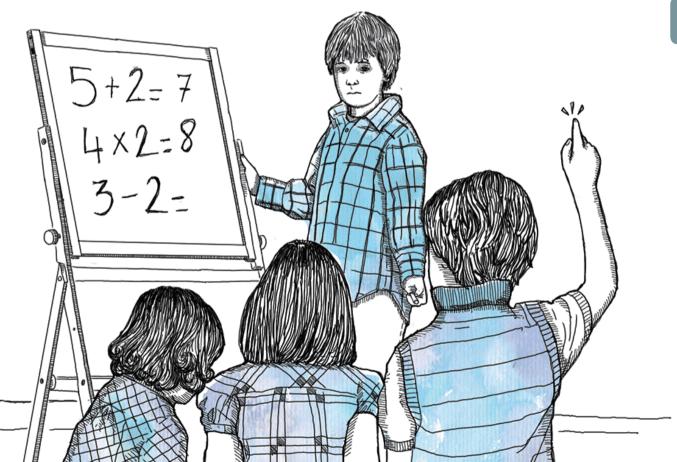# The celebration of learning in schools21

IDEA

In the learning setting of every school21, assessment is both a celebration and a qualification, a gauge of education practices, a guide, a commitment, a test, a presentation, a notebook, a learning diary and the agreement that concedes autonomy so that students and teachers can structure their interaction. Every assessment experience is a learning opportunity.

This means of evaluating is what characterises a model of personalised education where both students and teachers share the responsibility of community learning. Understanding that we are different, that we learn in different ways and through the involvement of others, implies an assessment with various tools and the continuous means of representation from all parties.

The assessment is a shared reflection and collection of several demonstrations of learning, both the process and the products, which guides the student in order to make them more responsible and

$$5 + 2 = 7$$
$$4 \times 2 = 8$$
$$3 - 2 =$$

> **"**
>
> In schools21 assessment and learning are inseparable entities

autonomous in all of life's decisions. This is how to understand assessment in a personalised learning community.

In schools21 assessment and learning are inseparable entities. The two go hand in hand in coordinating changes in methodology, the design of experiences and the role of students and teachers. Assessment is not the be all and end all, assessment is the bridge that regulates the scaffolding process and the construction of knowledge.

The shared identity of learning and assessment in a school21 is manifested in:

- ➤ Communicating the criteria and proof of students' assessment, assisted by various clear and explicit depictions of their grades.

- ➤ Increasing the number of assessments, distributed throughout the process, and helped by various tools that convert each measurement and opportunity for evaluation into a learning experience in itself.

- ➤ Overcoming the exam as the sole proof of learning, assembling the final mark thanks to the results from various tools aimed at both the process and the product.

- ➤ Constant guidance for students, paying attention to the meaning of their mistakes and with the intention that everyone, at their own pace, manages to improve their learning, helped by agreements or commitments and the creation of optional activities, prizes or medals.

- ➤ Accepting students as evaluators of their own learning and their peers' learning; offering different tools from quizzes and rubrics to learning diaries and portfolios, which help them evaluate themselves and properly advise their peers in accordance with the assessment criteria.

- ➤ Understanding the final and compulsory mark belongs in the records, as the result of an active assessment process that integrates the richness of all these elements.

- ➤ The guided and increasing autonomy that these strategies give to the student to make them ever more conscientious and responsible in the assessment of their own learning and in their life.

PBL and authentic assessment of learning are the tools that steer the school towards more personalised and community-based education. The student and assessment are at the centre of every learning experience; both make up the identity of a 21ST century school. Projects and assessment open doors to the dormant creative potential in each student, inspiring and guiding their intelligence. Joining project based learning with authentic assessment is the best way to promote creative experiences which generate transformations in our schools, as well as in our students and our own environment.
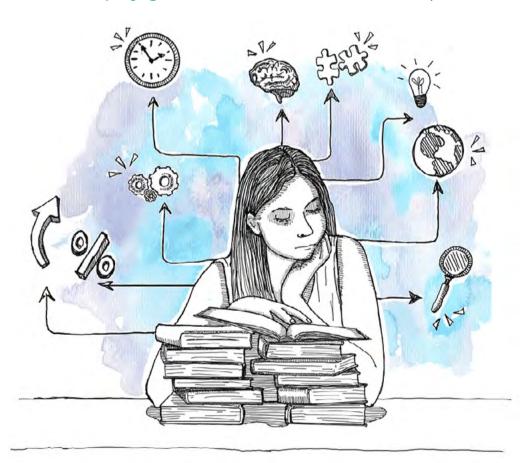
Assessment for learning more and better

METHOD

➡ Personalised education in the 21ST century is characterised by methodological enrichment and, consequently, enriched assessment opportunities and tools. Rubrics are used to assess grade assignments, presentations, cooperative learning roles, projects, written and oral tests, learning portfolios and diaries. Schools21 are aware of and employ various assessment tools. As we found in our visit to High Tech High in San Diego, **we can recognise many ways of demonstrating and accompanying the entire learning process using various tools**.

The wealth of assessment tools is not an open bar where students can choose how they are evaluated, but rather a way of authentically grading, measuring and assessing the depth and completion of learning. Somewhat schematically, we can say that some assessment tools stand out for their quantitative value and focusing on the product of the learning, while another set of tools does so for its qualitative value and focus on the process.

7. AUTHENTIC ASSESSMENT

> **Reflecting on our own learning and its performance is an exercise in responsibility and creativity**

However, they are all better located on a spectrum that grades their qualities. At the same time, the nature of the content to be learned also influences the way that we choose the most appropriate assessment tools. Therefore, the final mark or grade that the certification system requires is made up of various moments and assessment tools that are clearly defined and shared. All the assessment tools and opportunities form part of the official qualification. Integration and enrichment of the assessment tools in the learning setting is the best way to guarantee authentic assessment is being achieved.

➲ If we want to transform the assessment into a tool that contributes to learning and that encompasses the diversity of its features in the best way possible, as a process and as a product, **it is necessary to share and clearly explain the assessment criteria and its indicators.** To the extent that they are shared, criteria and indicators allow students to tailor their behaviour and know what is expected from them in every learning experience.

Authentic learning assessment is an assessment which communicates, does not hide and does not expect to measure or qualify experiences that are outside the reach of the students, or that they have not previously practised. Authentic assessment should aid learning. Communicating and sharing the assessment criteria is one of the most useful practices to involve students

in their own learning process, encourage their autonomy and responsibility and give them a lead role. If we want students to be aware of and responsible for their learning, we must share with them the expected achievements of every activity.

The possibility of using graphic representations such as ladders, pyramids, thermometers, targets, lifts and compasses to visibly and permanently depict progress in the classroom is an effective practice. It is not just about sharing evidence of learning, but also sharing it as clearly as possible.

➲ **Self-assessment is one of the most important learning experiences in the school21**. Students are able to steer their own learning if they are encouraged to do so with quizzes or reflexive diaries and other tools, such as portfolios. Reflecting on their own learning and performance is an exercise in responsibility and creativity that can be stimulated by short questions, quizzes or texts, but also through artistic depictions, drawings, writings, videos, recordings, collages...

Accordingly, portfolios are one of the most common assessment criteria in the transformation project of every school21. A portfolio is an ordered collection of learning materials and evidence, chosen by the students themselves, which attempts to explain both the learning process and the final achievement, reflecting on it and evaluating

INTELLIGENT LEARNING

Evaluation of the learning ←——————————→ Evaluation to "keep count of things"

self-evaluation

evaluation among equals

portfolios

headings

test-exams

expositions
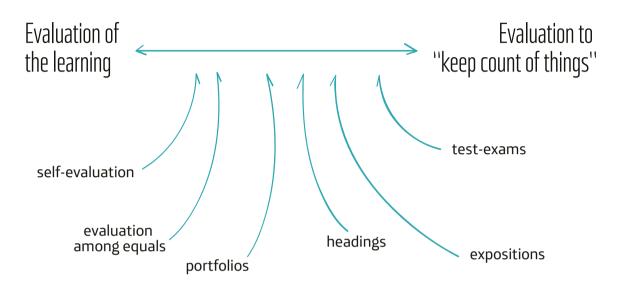
> " Portfolios are an excellent source of communication with families

it, giving the learner and creator the main role. Every portfolio is a unique piece, a learning diary of material specific to each student, where they reflect on the learning process at the same time as documenting their development.

A portfolio is an effective assessment tool that allows thinking strategies to be integrated with a number of demonstrations of learning. In this way, the teacher encourages their students to use the cognitive strategies that we analysed in previous chapters with the aim of regulating and guiding their own learning. Every student reflects, helped by different thinking routines: what they enjoyed most about each area of the project, what the main difficulties they encountered were, how they solved them, what each proof of learning means, why they chose it, how it is linked to other events that occur in the real

world, what they think about their own performance, how their participation in the team was, and many other questions about their own learning.

Moreover, the portfolio is not a notebook or common, closed, schematic and boring assignment. It is an original artistic piece that the students can creatively present and organise as they document their learning and reflect on the process. Therefore, it is both an assessment tool and a learning experience in itself. Creating project and subject portfolios is the best way to document learning and, at the same time, the live narrative constructed by the inner voice in the unique growth of each learner. Furthermore, portfolios are an excellent source of communication with families, who can participate with their opinions and collaborate in the creation along with the students.

What can I do in my school?

ACTION

1 **Break down the grade.** Create a timeline of your subject. How many times have students been assessed and with what tools? Try to divide final marks of a project or term, supported by different assessment tools, assigning a certain percentage to each. A bit for an exam, a bit for a presentation, another bit for teamwork, and again for mind maps, maybe a bit more for the final product and the results of self-evaluation. To assess learning is to assemble a multi-faceted prism.

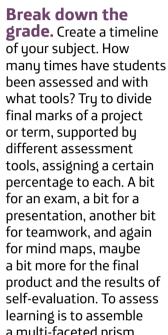**2** **A good rubric is very important.** Rubrics are an excellent tool to share with students. Every rubric provides a graded manner for evaluating the quality of a product; thus it clearly shows us how to improve it. Rubrics for evaluating students' presentations, work, mind maps, text comments, final outcomes of a project, etc., allow the assessment criteria to be clearly expressed. Do not do assessments alone, make a rubric of everything you can and share the responsibility with students.

3 **Create your own portfolio.** Reflect on your professional achievements, write a few lines or use mind maps to think about the design of your new projects and career path. On the first page, explain who you are and what skills you have, compile photographs and document the work of your students in the classroom. Show examples and reflect on them. Use the work to attend events and conferences on good practices .

BIBLIOGRAPHY

- Veronica BOIX MANSILLA, Anthony JACKSON: *Educating for a Global Competence: Preparing Our Youth to Engage the World.* Asia Society, New York, 2011.

- Guy CLAXTON et al.: *The Learning Powered School. Pioneering 21ST Century Education.* TLO Limited, Bristol, 2011.

- OECD: *Think Scenarios. Rethink Education.* OECD Publishing, 2006.

- OECD: *Teachers for the 21ST Century. Using Evaluation to Improve Teaching.* OECD Publishing, 2013.

- Alec PATTON: *Work that Matters. The Teacher's Guide to Project-Based Learning.* Paul Hamlyn Foundation, 2012.

TO LEARN MORE

Big Picture Learning

www.bigpicture.org

The Big Picture schools network is found in Canada, Israel, Australia, the United States and the Netherlands. It is an initiative which encourages connections between schools and their local communities, the active and autonomous participation by students, and the development of more specialised education through project-based learning. The relationship between these projects and learning relates to real life so directly that many students do full-time internships or volunteer work in organisations or companies related with their projects.

New Tech Network in the USA

www.newtechnetwork.org

The New Tech Network incorporates hundreds of schools which have consolidated their transformation into schools21, supported by their project-based learning methodology and an intelligent use of technology. This means that students and teachers organise course projects and calendars together, creating products related to real life, especially digital ones. Technology is used as a measure to create more personalised learning routes for each student and increasing their attention, as well as the possibility of making more creative projects that are authentically linked with the students' futures.

High Tech High in San Diego, United States

www.hightechhigh.org

The High Tech school has boldly adopted many of the changes that we have mentioned in this journey from the curriculum sources. Thus, they have launched specific and significant transformations in planning, the roles of students and teachers, and classroom methodology on their road to becoming a school21. Their model has already spread to over a dozen centres in the United States.

The management and teaching staff are certain of three key premises. Firstly, the mind and hands play a role in learning, that is, combining thought with practice. Secondly, reality should be found within school rather than outside, and must be visible in relation to everything that happens in the classroom. Finally, classes and schedules are not conceived as closed subjects and organised into groups of different levels of difficulty, but rather in meaningful projects.

8. DESIGNING THINKING THAT WILL CHANGE THE WORLD

⬈ Let's travel to Ahmedabad.

⬈ We'll discover the role of creativity in our school21 project and discover specific techniques to integrate it into the classroom.

⬈ We'll learn to improve learning projects guided by design thinking methodology.

WATCH VIDEO

Creativity which moves the world

JOURNEY

A campaign against school bullying, the alternative design of plastic packaging, a sister-school programme, fund-raising jumble sales, waste water purification experiments, sociocultural animation projects, the recovery of natural areas, sports races and competitions, concerts, magazines, encouraging
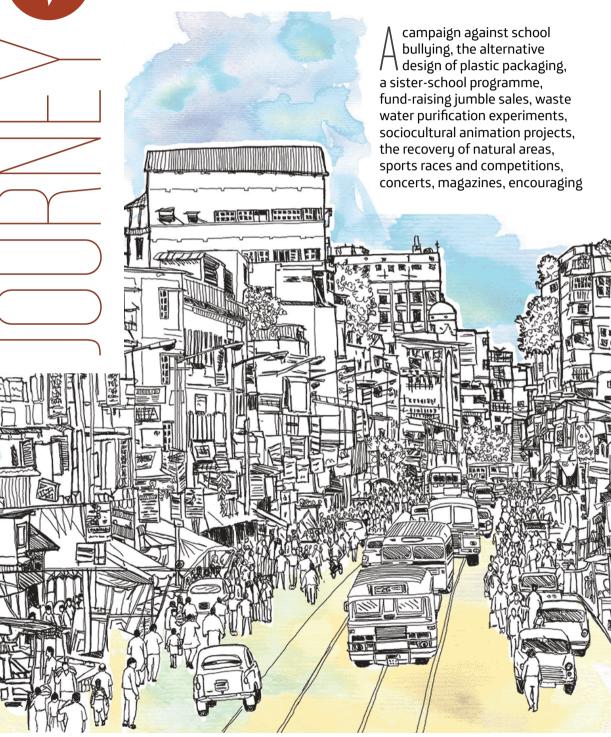
and accompanying older people, waste recycling, artistic creations, documentaries, campaigns for the awareness of all types of social and ecological causes, the rehabilitation of public and natural spaces… Since 2009, the international Design for Change initiative has spent over five years pushing forward social transformation projects, led by children of all ages in thousands of schools around the world and inspired by design thinking methodology.

> " Design for Change has gone from being an educational and social phenomenon in India to becoming a new methodology

For the last few years, Riverside School in Ahmedabad, India has been working with a more personalised education model for primary education based on the multiple intelligences theory. As we proved in Barcelona at the beginning of our journey, schools21 are supporting methodological enrichment methodology that offers all students better opportunities to become successful, helping themselves to various activities and ways of representing and relating to knowledge. Since those initial years of change, they have expanded this by incorporating project-based learning and the discovery the design thinking methodology. In the words of the project's creator, Kiran Bir Sethi, "it is about infecting children worldwide with the 'I can' bug, so that they feel prepared to face the problems surrounding them, so that together they see and devise creative solutions and carry them out themselves". Schools21 show us that the best way of predicting the future is to design the present.

Currently, Design for Change has gone from being an educational andsocial phenomenon in India to becoming a new methodology. It holds an annual conference, publishes different journals to help guide the creation of projects and has several teacher-training modalities, which are giving rise to the first scientific studies demonstrating their success. Moreover Kiran Bir Sethi's initiative has the support of Project Zero of Harvard University, the sponsorship of Howard Gardner and the collaboration of the leading studios revolutionising design thinking methodology at the present time: IDEO, CannonDesign, Kaos Pilot, the National Institute of Design and the Stanford Institute of Design.

Organising creativity: design thinking

IDEA

Historically, scientific method has been responsible for framing thinking strategies that were more algorithmic. Formulae, analysis, processes, synthesis, deductions, inductions, comparisons... are processes integrated into the framework of a solid methodology which guarantees the successful solution to a problem. However, when we encounter challenges that we are not able to solve, we turn to other more imaginative strategies.
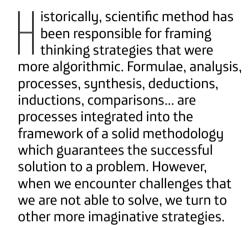
Creativity is practised and integrated differently in every culture. However, despite characteristics specific to each discipline, there is a common pillar which allows us to organise these strategies and coherently introduce them into our own learning environment. It is the theoretical framework known as design thinking. The scientific method is to strategic algorithms as design thinking is to creative strategies.

Currently, research into creativity is centred on defining the design thinking process, as well as thinking strategies which are integrated in a methodology which can be applied to any field.

The design thinking methodology offers a coherent framework where everyone can learn to be creative.

➡ It is an especially empathetic process, which observes reality through qualitative and ethnographic methods, not only quantitative. It seeks to look at the everyday from a new perspective, like seeing something for the first time, discovering that which escapes us in order to overcome a challenge or solve a problem. Experiential activities, observation, contextual analysis, the creation of mind maps, brainstorming techniques, organising maps of ideas and opportunities, interviews, excursions and tours, recordings and taking photos are all strategies specific to the first two phases of the process: observing and understanding.

➡ We need to imagine, experiment and test out. Expressing more graphic, narrative and visual codes, as well as verbal ones. Using pictures, gestures and montages to avoid only using words. Using one's hands to build models and prototypes, do puzzles, draw, design mind maps, build and destroy. Play, visualisation, narration, storytelling, the participation in interpretation dynamics, the search for rare similarities, comparisons, creating metaphors, graphic depictions and drawings of projects or of their participants with the creation of imaginary profiles... These are all strategies specific to the next two phases: creating ideas and prototypes.

> **"**
>
> The scientific method is to strategic algorithms as design thinking is to creative strategies

Teamwork and repetition –as many times as necessary– in the processes of observing, understanding, creating ideas and prototypes all characterise the creative process. The use of roles and other cooperative learning techniques appear throughout the process. When looking for new ideas, it is much more efficient to stimulate the process in teams rather than do it alone. Reflecting on drafts and prototypes, creating portfolios that illustrate the process, trials and testing or public presentations and exhibitions are all activities specific to the final phases: testing and communicating.
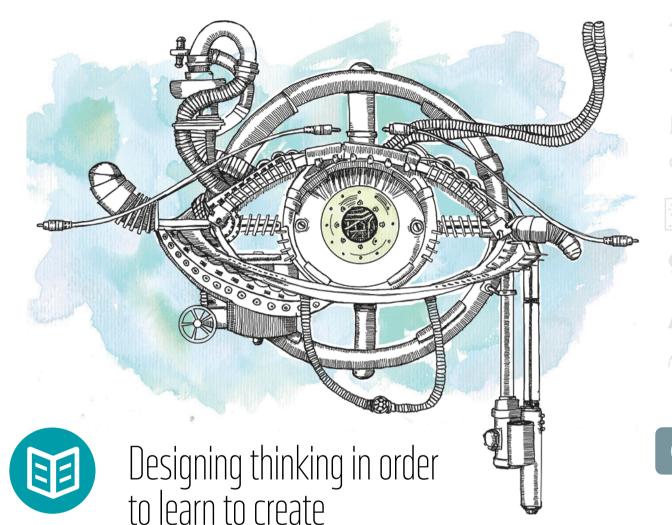
In each of these phases, they alternate between two distinct moments. Firstly, disqualification of ideas is postponed in order to generate the largest number of ideas, alternatives and prototypes possible, thanks to divergent thinking; at this point, more is better. Secondly, the ideas and prototypes are chosen, grouped and decided upon and the task is focused on the development of the alternatives into which we choose to delve deeper; in this case, less is more.

Designing thinking in order to learn to create

METHOD

→ **FEEL: observe and define.**
Building the challenge or defining the problem, whether it is together with your students, organised in groups, or allowing them to be the key players in your definition:

- Basing it on the curriculum and your suggestions.

- Giving them different challenges to solve, all of them non-"googleable", and which, as we've seen with PBL, do not have a single solution.

- Helping them with pictures and photographs which show injustices, incomprehensible phenomena, new experiments, interesting or shocking pictures, etc.

- Selecting videos or excerpts from documentaries that expand the content and present engaging approaches in your field.

- Presenting autobiographies and exciting lives of authors and researchers.

- Attending exhibitions or cultural events.

- Strolling around the school or through the neighbourhood.

> **Define the challenge positively, with infinitive verbs and few words, in no more than two lines**

- Looking for events in the press and the media related to your subject area (you can use news linked to the content, newspaper clippings, news extracts, etc.).

- Posing actual experiences or problems in the school itself, such as discussions, problems of coexistence, exercises in democratic participation, making plans with students, increased participation of families.

- Inviting experts, associations and political and social representatives related to your community to present their work related to the content of your subject area.

Finally, define the challenge positively, with infinitive verbs and just a few words, in no more than two lines.

Inform students of the link between the challenge and the aims of the curriculum and the assessment tools that accompany the process. Introduce authentic assesment as we described at the beginning of the chapter.

- ➡ **IMAGINE: understand and create ideas.**
  Once you have defined the challenge, encourage your students to explore and empathise with it in order to have a deeper understanding:

- Create simple columns of knowledge around what they already know and what they need to know.

- Turn to mind maps to organise the content in the subject area.

- Create a concept map that breaks down the challenge and analyses it in four or five parts, in which we can respond to the questions "what", "how" and "why" in one table of three columns.

- Applying the brainstorming technique with large walls of post-its where all related ideas are revealed and organised, plus those obtained through observation and conversations.

- Playing with ideas in the mind map of post-its, photographing it, grouping and expanding ideas and creating new threads.

- Observing the map and searching for opportunities and answers that seem hidden in the various ways in which we can configure the ideas.

When the challenge consists of the development of a project or involves the participation of people, encourage the process by means of:

- Qualitative interviews comprised of questions eliciting simple, open answers; three or four questions that allow us to better understand the perspective of the people involved in the challenge.

- Generating conversations especially focused on the whys, in the open and ethnographic search for the causes that underpin a problem.

> ❝
>
> Return to the challenge, analysing whether it needs to be redefined or reworked

- Empathising, listening and heeding the context, asking the why of every element or performance.

- The observation and creation of logs to record the movements, characteristics and behaviour of the people and objects involved in the challenge during a specific period of time.

- The support from people related to the challenge and obtaining information in a monitoring journal.

Finally, return to the challenge, analysing whether it needs to be redefined or reworked. Search for a definition that represents the observation and the understanding you have gained thanks to these strategies.

From your work through observation and understanding, and with a clearly defined challenge, start by thinking of new creative solutions:

- List the most obvious solutions or projects and try to group them into a more complete project that improves them as a whole.

- Look for examples of solutions or projects that have been completed but that did not have the expected results. Ask yourself why and learn from them.

- Visualise the solution: What will happen if we solve the problem? What will the scenario be? Describe it, ask what have you changed in solving the challenge or eliminating the problem.

- Describe the characteristics of the project or the perfect solution. Add an original title.

- Look for inspiration in other places: create analogies to get new ideas. If our project was an amusement park, a museum, Wikipedia, nature, a beach or mountain landscape, a shopping centre, a zoo, a laboratory… what would it be like? What happens in each of these places that we might include in our project or solution?

- Use thought-provoking analogies to help yourself. Use antagonistic sentences to inspire your students: "It is possible to plant fruit without seeds", "Mangoes can be square", "Strawberries are blue", "Let's plant meat and fish".

- Get all the ideas that you can through brainstorming. Remember, quantity is the key: build sentences with different ideas, support crazy ideas, delay judgement until the end of the process and use visual elements to help you.

- Vote on the ideas from the brainstorming, letting each group member choose the best three or five.

Once chosen, create a project or solution with them. Create a table with the features that fulfil the perfect solution or project with the most popular ideas. Choose a new original title to define it.
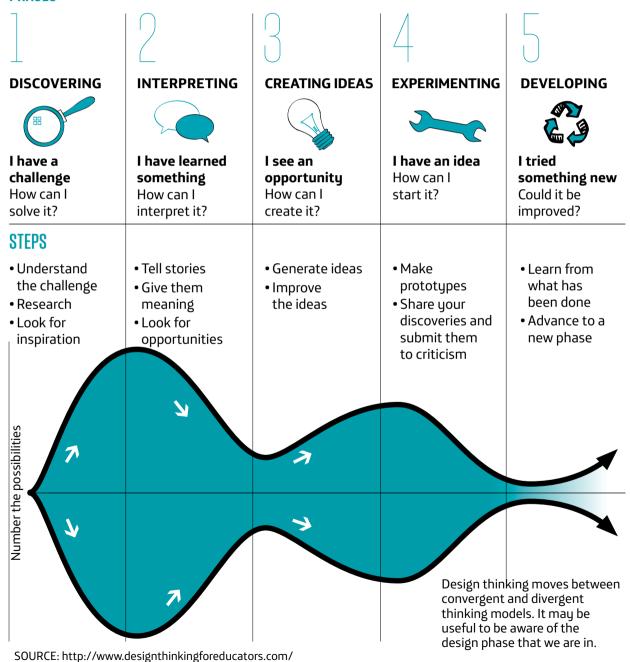
DESIGN THINKING

Every day, classrooms and schools around the world face design challenges. From communication systems to the management of class schedules, educators face real, complex and varied challenges. Design thinking is an approach structured in five phases for the generation and development of ideas, which may be very useful in looking for solutions in the classroom.

PHASES

1	2	3	4	5
DISCOVERING	**INTERPRETING**	**CREATING IDEAS**	**EXPERIMENTING**	**DEVELOPING**
I have a challenge How can I solve it?	**I have learned something** How can I interpret it?	**I see an opportunity** How can I create it?	**I have an idea** How can I start it?	**I tried something new** Could it be improved?

STEPS

• Understand the challenge • Research • Look for inspiration	• Tell stories • Give them meaning • Look for opportunities	• Generate ideas • Improve the ideas	• Make prototypes • Share your discoveries and submit them to criticism	• Learn from what has been done • Advance to a new phase

Number the possibilities

Design thinking moves between convergent and divergent thinking models. It may be useful to be aware of the design phase that we are in.

SOURCE: http://www.designthinkingforeducators.com/

> "
>
> **The design of the plan is as important as its prototype**

➡ ACT: create a prototype and make it.

- When we have integrated numerous ideas and created a specific project or solution, we can begin to make a prototype. This means generating the first tests or devices to see how it works. At this point, it is very important to test out our ideas, fail and check what needs to be improved before putting them into practice. In this phase, failing and improving each new prototype is synonymous with learning.

- If the prototype is an object, element or product:
  a. Create prototypes using drawings, diagrams, or better yet, with your own hands. Make building games, puzzles, post-its, wooden blocks, toys and everything that you need to create a prototype open to improvement and redesign.

- If the prototype is a project:
  a. Create a storyboard to represent each phase of the project. In each box, write a list with the dominant emotions at that time, the necessary materials and the main players involved.

  b. Write a text in which you narrate each of the phases in the project. Invent scenarios with scripts of what could happen in each phase and play it out with your classmates. Be very aware of any faults, in order to correct, learn and introduce modifications in order to improve the project. Role-playing is the best manner of prototyping projects, but especially focus on anything outside the plan that can be improved, or that could lead to problems when putting it into practice. This is the real aim of the activity.

  c. Imagine the profile of a person who will take part in your project. Give them a name, draw their portrait, think of their likes and interests and how they would feel at every stage of the project. It is not about capturing them perfectly, but imagining how the participants will react to each phase. Thus at this stage, it is important to root out the necessary modifications, so that the project will be as good as possible when it is put into practice. The design of the plan is as important as its prototype. In mind maps, all the ideas that we generate are good, and their true success is measured in practical execution; thus, the prototype phase allows us to make as many improvements as possible. With these strategies, we can fail ahead of time and as many times as we want.

- Finally, bring the project to life. Execute your proposal. Enjoy the process and celebrate the learning. Show what you have learned by taking part in the authentic and continuous evaluation of the entire process.

➡ SHARE

Document the development of the process with your students and share it on your centre's website, or record videos, take photos, etc. Create a permanent display or exhibition together with the students and share it with everyone via the Design for Change website in Spain. http://www.dfcworld.com/dfc/spain/
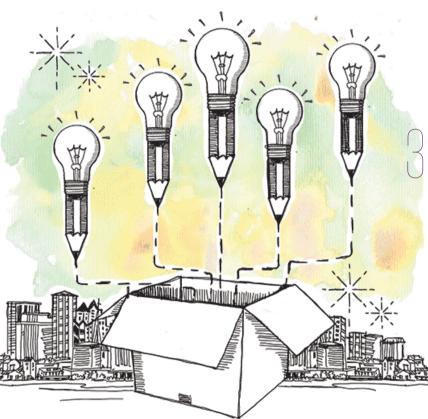
What can I do in my school?

ACTION

1 Visualise solutions. Use the creative strategies that we learned in this chapter. Do you have a challenge in mind? Visualise the scenario that occurs when you overcome it. What is it that you changed? Use your imagination to describe the behaviours, components, qualifiers… everything that shows that you have achieved the aim. Now choose a part. Focus your attention on one component and take the first step to change just that. Design your own change.

2 Describe a typical day in your classroom. Make a prototype of a session. Design a new activity or project for students in the learning scenario of your school21. It can be a palette, a matrix or a project with which we have learned chapter-by-chapter. Now describe in your mind how the session will develop. You can create a simple storyboard with four pictures to represent four moments of the session. on each picture, list the resources that you will need, the emotional climate and the key players. In this way, you can plan more appropriately, improve what you need to and enjoy your plan more when you put it into practice.

3 Design the thinking in your teaching staff. Try to share the design thinking process with your peers, teachers and families. Do you have a challenge to overcome? Increase family participation, encourage innovation, raise awareness of the new educational model to become a school21… Organise a morning or afternoon session following the protocol of the creative strategies that we have seen in this chapter. Innovation is born from the cooperative and creative work of the entire team of teachers.

BIBLIOGRAPHY

- **Todd HENRY**: *Creatividad práctica* [The Accidental Creative]. Conecta, 2013.

- **Hasso PLATTNER**: *Mini-guide: an Introduction to Design Thinking + Bootcamp Bootleg.* Institute of Design at Stanford.

- **Hasso PLATTNER**: *Design Thinking Mixtapes Series.* Institute of Design at Stanford, 2011.

- **Amalio A. REY**: *Pensamiento de Diseño y Gestión de la Innovación* [Design Thinking and Managing Innovation]. Emotools, 2011.

- **Riverdale + IDEO**: *Design Thinking for Educators.* 2011.

- **Ken ROBINSON**: *Out of Our Minds. Learning to Be Creative.* Capstone, Chichester, 2011.

- **Thinkpublic**: *Prototyping Framework. A Guide to Prototyping New Ideas.* NESTA, 2010.

TO LEARN MORE

Design for Change, India

www.dfcworld.com

The Design for Change educational proposal has conquered the world. In 2013, over 35 countries across five continents have shared nearly five thousand projects in order to transform and improve their immediate environment. The book *I can* by Amar Chitra Katha gathers dozens of original stories with a huge impact on their communities. A headstrong group of students have improved the lives and practices of thousands of people thanks to their commitment to building a better future.

Riverside Learning Center in India

www.schoolriverside.com

A school which, providing the educational application of multiple intelligences, supports the development of global competition and design thinking, creating a new methodology that has conquered the world in order to transform and improve it: Design for Change.

Realm Charter School in San Francisco, United States

www.realmcharterschool.org

Thanks to project-based learning, this school made the leap to working with design thinking, involving its students in the remodelling of its facilities, such as playgrounds, classrooms, and halls, plus social transformation projects around the city and having a more active participation in school management and the organisation of subject areas and projects. All this is planned with the support of a pioneering team in educational applications of design thinking: Studio H.

9. A DIGITAL HEART

- Let's travel to Uruguay

- We'll discover what technological integration plans have in common in the schools21 around the world.

- We'll design, floor-by-floor, the digital building of our innovation project.
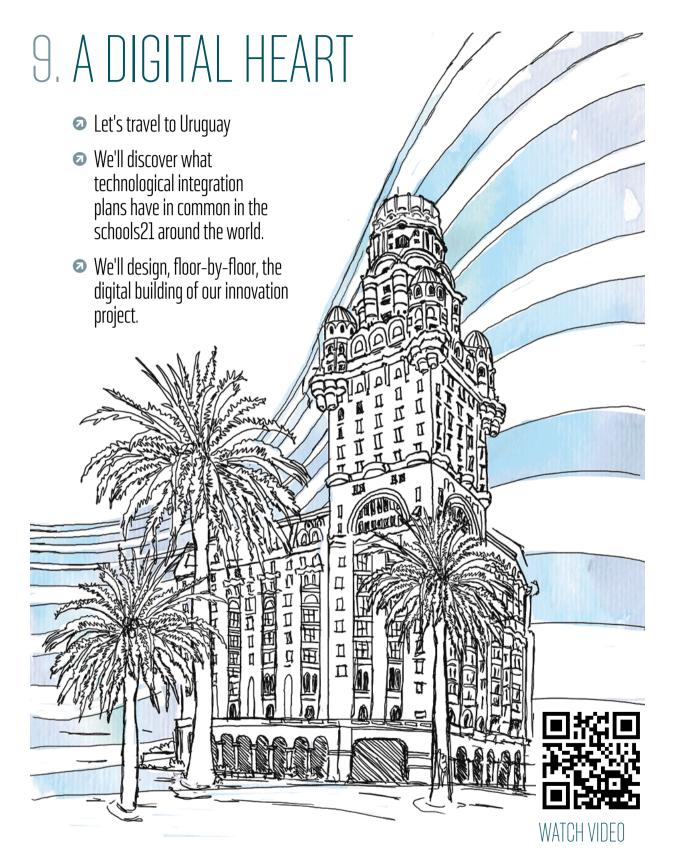
WATCH VIDEO

A digital nature reserve

The Laboratorio Tecnológico in Uruguay is disguised as a natural park. This park for innovation is not defined by its businesses, but by the names of its trees, which help locate each building. Ceibal is found in the building of the Ceibos, the Spanish name for the cockspur coral tree. If we wanted to go to the Science Museum, we would have to follow the signs that send us past the Acacias building, between the Firs and the Oaks buildings, far from Ceibal and IBM. It is a curious link between reality and virtuality: tree-buildings where hardware and software fruits grow.

And so, we are received by the Ceibos building by a wavy star with five green points and a red centre, which is found on the ceilings, floors and walls that bounds a new territory. We have stepped inside the Ceibal Plan and its logo greets us.

Our feeling in the Ceibal is like breathing the restlessness of a start-up that has grown to 250 employees with an average age of 32. So the table football, unending paper and blackboards full of doodles and ideas do not seem out of place. The Ceibal Plan has the benefit of being an initiative directly backed by the President's Office. This is how the Ceibal brand has been consolidated, no matter what happens to the educational system should there be governmental changes.

There is deliberate activity and drive. We also find linden, or so say the various bit-shaped bins hanging from the ceiling. Linden makes for a relaxing infusion that helps incorporate ideas in the confusion of thinking. A bin, a bit, the bin-bit, the bin-linden, the linden-bit. Once again, the natural and digital occupy the same space.

A digital country, floor by floor

On the first floor, smiling youths sharing mate tea read infographics and other animated data on their screens. They are arranged in a large pasture of tables and computers. We are in the Educational Management Department, responsible for social development projects, training and educational activities. The large central space on this first floor is surrounded by numerous meeting rooms on each side. The corridor, covered in post-its is furnished with empty cardboard boxes, which used to be carriers of all types of technology.

On the ground floor, they make sure that everything works correctly. This is the Technical Management Department of R&D, Repairs and Connectivity, among other things. Everything that happens

JOURNEY

> **"**
>
> Schools have found their digital dimension. A virtual, but real space which needs to be arranged and furnished

on the first floor is backed by this technological support.

Thanks to the improvements in connectivity, broadband and the possibility to communicate via video, one of the pioneering experiments for 2013 focuses on teaching English. To achieve it, there will be two weekly video conferences in each classroom with a live feed of a native teacher. Moreover, the video conferences are supplemented with the organisation of contents and didactic sequences on the Ceibal platform. Another key area is the robotics project. Last year it entered its testing phase, and this term the number of applications has already tripled. It is a smart combination of building games and Scratch and Tortubot open software. The robots are constructed with engines, wheels and other easy-to-handle electronic connections, and follow all types of instructions as if they were compliant

remote-controlled cars. The students write their own lines of programming, looking for applications in the fields of maths, computing, technology or physics. With their help, the teacher sets up physical formulae and equations, but also enables them to become familiar with the language of programming or implement their prototypes in project based learning.

In this technological laboratory disguised as a natural park, bits and trees grow together at the same time that the schools discover their own digital building. In the vast world of virtual reality on the net, Ceibal organises the digital space of schools across the country, floor by floor. In Uruguay, schools have discovered their digital dimension. A virtual, yet real space that needs to be functionally organised and furnished, in the exact same way as you furnish your physical space.

Building

A school's digital building is as important as its physical building. But its organisation does not follow simple digitalisation of paper resources onto the screen. Nor can it be based on a static content design using compartmentalised and rigid materials. Technology is an excellent tool for building a personalised learning community, but from a constructivist and connectivist view of learning and not from the automation of educational labour in the classroom. Schedules and payment receipts can be automated, but you should not automate teaching work, mistaking it for the mere transmission of information.

Schools21 have constructed a digital building where knowledge is generated in an open, and Internet-connected environment, but one that is their own, organised and educational. So far, all of the experiences that we have seen have promoted student autonomy, challenges and cooperation, thanks to the technological integration organised in their digital building.

The digital school is a dimension which we construct according to the design of our learning scenario. It is never a mould to which we must adjust reality. Research into psychological, pedagogical and sociological sources are the key benchmarks for both the digital and physical design of the building. This is the coherent and inclusive spirit of our 4x4 model for innovation. The integration of the digital dimension empowers learning which is constructivist, active, and varied in methodology and representation. It integrates cooperative tasks, thinking strategies, challenges and conflicts and seeks student autonomy.

Technology contributes to improving the education of 21ST century learners. But this is because it primarily focuses and adapts to the student, not because it is a benchmark tool in the development of digital literacy. Technology facilitates autonomy, teacher proximity and feedback, learner commitment and the versatility of representations, formats and methodologies.

When we reach the point where the learning scenario and digital building of our school are joined in a single project, we will be prepared to make changes to the physical structures. On designing an open digital school which is available on all students' devices, we break physical barriers. The personalisation of learning
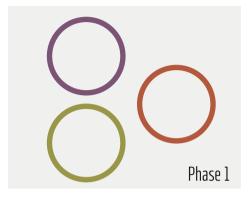
CONVERGENCE OF PHYSICAL AND VIRTUAL SPACES

◯ **Virtual space**   ◯ **Pedagogical space**   ◯ **Physical space**   ● **Virtual, physical and pedagogical space**

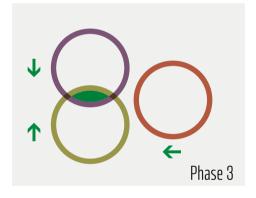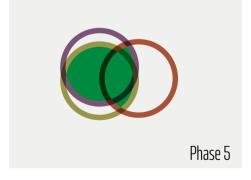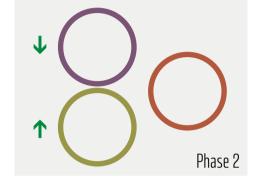Phase 1

Phase 2

Phase 3

Phase 4

Phase 5

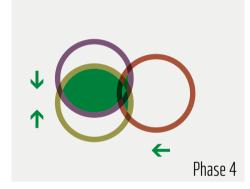Phase 6 — **Virtual, physical and pedagogical spaces**

> When we reach the point where the learning scenario and digital building of our school are joined in a single project, we will be prepared to make changes to the physical structures

is made possible through monitoring, whether this is done in large spaces, in choosing schedules and times, or the creation of adapted itineraries that are routed inside the digital building. Schools21 both expand and connect; they are mobile, ubiquitous, and flexible. They are connected to the Internet and adapt to changes in the epistemological source of the curriculum thanks to their digital dimension.
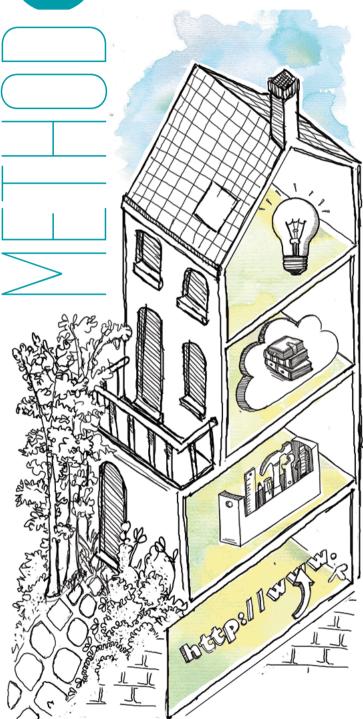
METHOD

The digital building of schools21

Schools21 have discovered their digital building. They occupy both a virtual and physical terrain, and have learned to build and organise their digital dimension in the same way that classrooms and learning spaces are furnished. However, we cannot mistake this new dimension with scheduling or budget management software, or with canned platforms that store teaching units so that all students repeat them over and over in unison.

A digital building is the structure that performs the miracle of converting the schools21 into benchmark educational institutions, open 24 hours a day, seven days a week. These are communities targeting and focussing on personalised learning. Schools21 are where students can navigate to learn in an environment connected to the world, but organised according to the content of a curriculum. An expanded and connected school does not mean students must be learning at all times, but one that we manage to convert the digital dimension into a potential learning experience.

On designing a digital school that is open and available on any student's device, we are breaking down physical barriers. The personalisation of learning is made possible through monitoring, whether this is done in large spaces, in choosing schedules and times, or the creation of adapted itineraries that are routed inside the digital building.

Welcome to the digital building of schools21.

> Schools21 both expand and connect; they are mobile, ubiquitous and flexible

⊘ **First floor.** The institutional identity of schools21 on the Internet is their website. The website is a vibrant and communicative window that remains static only as required. It is the best place to celebrate and demonstrate learning with parents and students and to create a community. Only through participation are communities created; this is why schools21 use social networks as a way to connect their emotion and motivation. The website of the Ørestad school in Copenhagen is an excellent example of this, and it is worth noting the website as a model of social communication (http://www.oerestadgym.dk). Its structure changes depending on the institutional profiles on Instagram, Facebook and YouTube. In this way, a simple tag on the social media catalogues the entries where students and teachers show what they do in the classroom on the Internet.

Schools21 display photos and videos of their learning experiences. They have profiles on Facebook, where they connect with ex-students, for example, as well as on Twitter, where they learn together with other schools21 and describe the progression of their growth. They have an institutional blog in which they do not write lengthly paragraphs, but rather describe their own experiences with photos and videos. And they are not necessarily professional or perfect; more than anything, they are real. They are the good practices of every school21.

The Montserrat School of Barcelona website (http://www.cmontserrat.org), as well as its platform for educational videos (http://www.think1.tv), are interesting examples to note. The website of High Tech High in San Diego also offers specific displays and sections to show the student projects year after year. Websites are the living, expressive digital museums of learning in the 21ST century.

⊘ **Second floor.** All teachers, students and professionals in the community are enrolled in an on-line tools platform. This platform is characterised by: security; a great capacity for storing information and resources; password-restricted user entry; cloud-based operations; real-time editing of shared documents; the creation of institution-related forms, emails, websites, calendars and presentations; and Internet-based collaboration and communication.

These tools are used by teachers and students in order to interact more effectively on the floors above. This level stands out for fostering communication and the shared and instantaneous collaboration on any type of document. The free and effective Google Apps and Office 365 are the two most widely available options. The economic and administrative management of the centre is also located here. The first and second levels are vital for the swift distribution of information and connecting with the community.

> A large part of learning occurs in virtual dimensions, with tools that intercede in reading, creating or interpersonal relationships

Third floor. In this space, the experiences point in two directions. Firstly, teachers work collaboratively to store, catalogue and organise their own creative resources or for the website, which they will use in designing learning experiences. To do this, they are helped by modular platforms, wikis and blogs, by the favourites bars of the browsers or the social bookmarking of content for the creation of a bank of their own resources.

This floor is aimed at creating a library of varied content, organised by subject, field, series, course, project or department, which increases both inspiration and new ideas in the design of the programme or getting past text as the only means of information. Digital libraries enable us to store audio resources, such as podcasts and recordings, and visual resources, such as videos and presentations. Moreover, they are excellent tools not only for students, but for the continuous training of the teachers themselves; many teachers record their performance in the classroom in order to get feedback from their colleagues. Internet presentations and experiences also enable schools21 to design their own reflective educational strategies to be deployed.

Secondly, this floor stands out for its arrangement into modular areas where there are three aims: organise the curriculum, design the setting for learning experiences and generate knowledge among students and teachers. It is common to find environments with didactic possibilities of programmes similar to Moodle, or that integrate the interaction and conversation using Internet tools like Edmodo. Other lesser-known applications in Spain, such Chamilo and Schoology, also offer a very positive return in a modular environment for guided learning. There are often digital conversations between students and teachers based on projects, subjects, matrices or other designs, or project coordination between teachers and the student interaction with the school content itself, even from their houses, or wherever they may be.

The Sydney Centre for Innovation in Learning and its secondary school platforms (http://hsconline.nsw.edu.au) and PETE for primary (http://pete.nbcs.nsw.edu.au), by its acronym for Primary Education Through E-Learning, are two fantastic examples of this, though we will have the opportunity to see many others. We can

> **In the 21ST century, aside from real experiences, a large part of learning occurs in virtual dimensions, with tools that intercede in reading, creating or interpersonal relationships with people**

find the Moodle platform, where students' PBL material is organised, made available in a simple, graded and didactic manner.

⊙ Fourth floor. The last, but by no means least, is aimed at creating personal learning spaces for students and teachers. The term PLE is an acronym for Personal Learning Environment.

In the 21ST century, aside from real experiences, a large part of learning occurs in virtual dimensions, with tools that intercede in reading, creating or interpersonal relationships. These tools shape and enhance our experiences. PLEs have transformed the world into a classroom, Skype into a land line, Twitter into a playground or a training session over an informal coffee, LinkedIn into a networking session, Blogger and WordPress into field journals and notebooks, blogs into magazines… we learn by organising our daily experiences on devices thanks to new tools.

PLEs are comprised of three main dimensions, which are distinguished by their roles:

- Reading tools and strategies: these are the sources where I obtain information, and include blogs, video channels, newsletters, RSS, online conferences, streaming, podcasts, wikis, etc.

- Reflection tools and strategies: I use these to transform, modify or create my own information. Transformation tools like Prezi, Visual.ly, Google Drive, Glogster, Blogger, etc.

- Relation tools and strategies: these are places where social interactions occur, such as Facebook, Twitter, Edmodo, forums, discussions, events, conferences, etc.

In schools21 around the world, students and teachers organise their own PLEs where they use their digital skills in any area of the curriculum. This model helps them to focus their work using executive routines which centre the attention on the tasks on screen, and introduces them to autonomous learning dynamics which will accompany them in their professional development for the rest of their lives.

Many centres have created their own institution-based PLEs, organising tools and differentiating their roles with colours and classifications thanks to www.symbaloo.com.
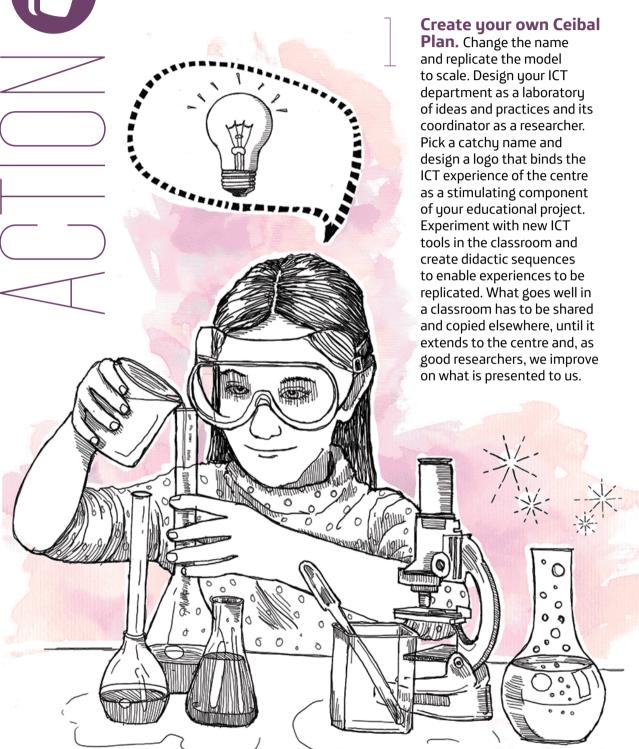
What can I do in my school?

ACTION

Create your own Ceibal Plan. Change the name and replicate the model to scale. Design your ICT department as a laboratory of ideas and practices and its coordinator as a researcher. Pick a catchy name and design a logo that binds the ICT experience of the centre as a stimulating component of your educational project. Experiment with new ICT tools in the classroom and create didactic sequences to enable experiences to be replicated. What goes well in a classroom has to be shared and copied elsewhere, until it extends to the centre and, as good researchers, we improve on what is presented to us.

> "
> ICTs become truly expensive when they are purchased and not used

2 **Promote the dynamic generation of good ICT practices in the centre.** And allow teachers to exchange them among themselves. A competition that encourages ICT experimentation from the teachers in our own centre, where students, families and teachers can also vote, would help promote good results. You can even give the prize an original name.

3 **Squeeze your ICT.** It is not so much about investment or resources as about efficiently using them. If you have a computer room, ensure that it is empty as little as possible; if you have a bag of devices, don't stop them from moving around the centre... What you have available has little to do with quantity, but rather with the commitment to obtaining the maximum benefit and efficiency. ICTs become truly expensive when they are purchased and not used.

4 **Exploit communication in your centre.** Information technologies are especially valuable for communication. Enliven communication in your centre through your ICT by a blog, updating the website or on social media. But don't get theoretical or tie yourself up in knots: the key is simplicity and honesty in the reality of everyday life, what we do well, how we perform classroom projects, what happened on the school trip to the museum... Tell the world what happens in your school.

5 **Communication is for everyone.** We have to communicate, but in a way that is shared. The experience will only gain educational meaning if we involve students, teachers and parents so that they can tell others what happens in the centre. Take turns with blog entries on subjects and courses; they do not have to be long or eloquent, only pictures and videos are needed. We lose our fear of communication by taking part in shared expression.

6 **Bring back the classics.** No book by Jean Piaget, María Montesori, Jerome Bruner or David Paul Ausubel ever looks bad in a staff room. Remember that pedagogy and technology should go in hand and if there is one thing that these authors taught us, it is they are behing many of the great innovations in school as we know it, and are still relevant today.

BIBLIOGRAPHY

- **Linda CASTAÑEDA, Jordi ADELL** [ed.]: *Entornos personales de aprendizaje: claves para el ecosistema educativo en red.* [Personal Learning Environments: Key to the Online Education Eco-system] Marfil, Alcoy, 2013.

- **Ian GILBERT**: *Why Do I Need a Teacher When I've Got Google? The Essential Guide to the Big Issues for Every Twenty-First Century Teacher.* Routledge, London and New York, 2011.

- **Stephen HARRIS**: *The Place of Virtual, Pedagogic and Physical Space in the 21ST Century Classroom.* SCIL Publishing, 2010.

- **Craig LINFOOT**: *Open All Hours - Virtual Classrooms that Effectively Impact Learning in and beyond the Physical Classroom.* SCIL Publishing, 2006.

- **Craig LINFOOT**: *A Natural Convergence and Opportunity: One School's Journey.* SCIL Publishing, 2007.

- **George SIEMENS**: *Knowing Knowledge.* Ediciones Nodos Ele, 2010.

TO LEARN MORE

The Ceibal Plan, Uruguay

www.ceibal.edu.uy

In 2007 the Ceibal Plan was inaugurated with the delivery of a small shipment of some 250 computers to the most disadvantaged areas in the hinterlands and a team of seven led by Miguel Brechner. The Plan had three clear goals: transform every computer into a tool for social inclusion, equity and the technological democratisation of the society, beginning with young people and the most disadvantaged social classes. This was the keyboard that became the social revolution in Uruguay in the 21ST century.

The Khan Academy, on the Internet

http://www.khanacademy.org/

The Khan Academy is a non-profit educational organisation and website created in 2006 by the American educator Salman Khan. Currently it is composed of a multidisciplinary team of over eighty people, passionate about education: developers, teachers, designers, strategists, scientists and content specialists. The Khan Academy offers practical exercises, instructional videos and a personalised learning dashboard which empowers students to study at their own pace inside and outside the classroom.
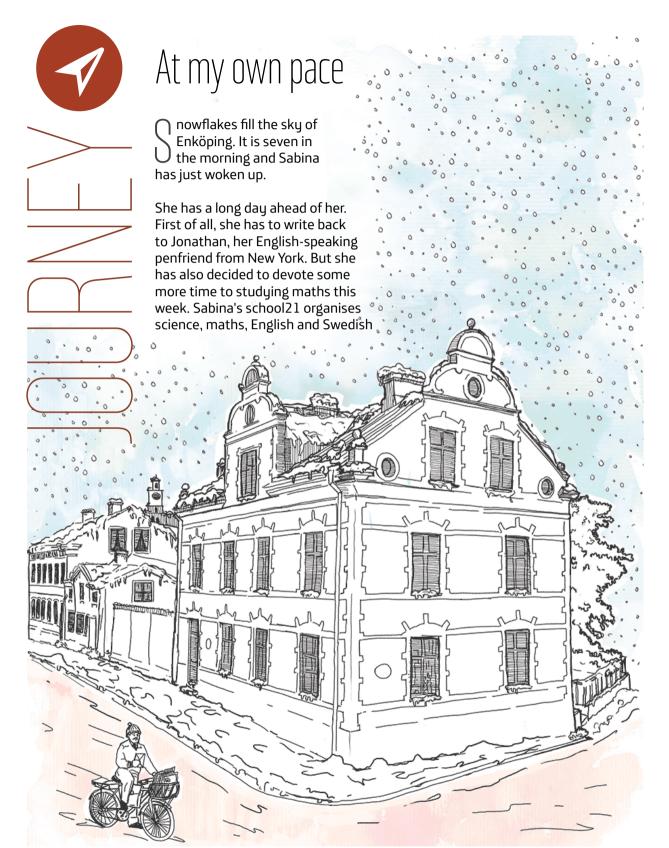
La educación prohibida, Buenos Aires, Argentina

www.educacionprohibida.com

"*La educación prohibida* (Forbidden education) is a film about education, which focuses on love, respect, freedom and learning".
Full stop. This is how director Germán Doin defines the initiative, "a project which emerges, not with the intention of showing what the best, or most ideal, experiences are, but rather to raise the curtain on other different forms of education, which, personally, I was far more interested in learning about".

10. LEARNING STEP BY STEP

- Let's travel to Sweden.
- We'll learn how to use technology in order to personalise learning.
- We'll develop a blended learning plan.

WATCH VIDEO

JOURNEY

At my own pace

Snowflakes fill the sky of Enköping. It is seven in the morning and Sabina has just woken up.

She has a long day ahead of her. First of all, she has to write back to Jonathan, her English-speaking penfriend from New York. But she has also decided to devote some more time to studying maths this week. Sabina's school21 organises science, maths, English and Swedish

> **Students learn at their own pace and choose when to take each test**

class into small content units that bring together activities, videos and other digital material. This scheme is posted on a web portal that she can access from any device with an active Internet connection Each content unit is called a "step". The curriculum for each of these subjects is composed of a sequence of some thirty steps for each course.

Sabina has already completed eight steps in maths this term. Her learning diary and the exercises for each step bear witness to her successful learning. She was the first to pass the tests for the eight steps she has finished. Not all students learn in the same way and at the same pace, which is why the schools of the Kunskapsskolan network have developed this incredible system where technology and pedagogy come together to design personalised education schedules.

Students learn at their own pace and they choose when to take each unit test according to their performance on a variety of evaluation tools that they use throughout the learning process. Of course, though, they are not on their own when they learn. Students can count on the support of a tutor throughout their learning.

Kunskapsskolan

Kunskapsskolan is not a tongue twister, although it might seem so. It means "knowledge school". Kunskapsskolan is an amazing Swedish education project that focuses on secondary education. In less than 15 years, Kunskapsskolan has expanded to over 36 schools in its home country, five in the UK, one in New York, and another in Gurgaon, India.

In 2013, they achieved unbeatable results. Sweden's standardised test results have demonstrated that year after year, Kunskapsskolan students obtain better results than the national average. Moreover, they outperform all schools catering to students of the same background or those located in the same region. It goes without saying that at Kunskapsskolan schools, talk of combating academic failure is simply unheard-of, among other things because it simply does not occur.

Each student has a tutor, and the two have weekly meetings to guide and monitor the student's path. Tutors tends to be experts in their field, but in this circumstance they take on the role of a "coach", somewhere between mentor and a learning trainer, weighing in on the strategies and agreed objectives. Kunskapsskolan's education project stands out for the design and digital orientation of its curriculum.
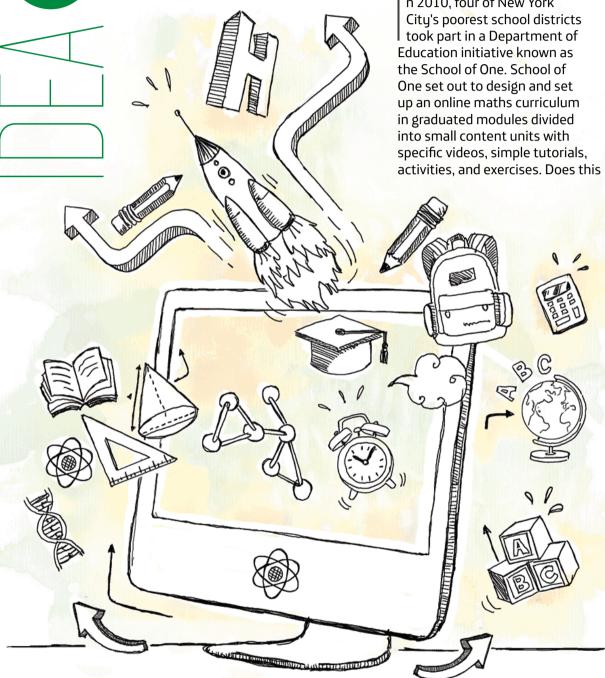
A great idea reproduced all over the world

IDEA

In 2010, four of New York City's poorest school districts took part in a Department of Education initiative known as the School of One. School of One set out to design and set up an online maths curriculum in graduated modules divided into small content units with specific videos, simple tutorials, activities, and exercises. Does this

> **The challenge of providing more personalised learning is a feasible one for any school thanks to technology integration**

sound familiar? In just one school year, the four schools achieved a significant improvement in the grades of those taking part in the programme.

The School of One model was the pioneer that lay the foundation for the iZone education innovation programme. iZone is currently a curriculum content platform for all of New York City's schools in which more than 250 schools and over 190,000 students participate.

Today, the challenge of providing more personalised learning is a feasible one for any school thanks to technology integration. In 2008, Clayton M. Christensen published *Disrupting Class*. Clayton's team predicted that technology would be the most disruptive element in the history of education.

Just as the book was coming off the press, a young systems engineer was filming some videos explaining basic algebra and arithmetic concepts. His young cousins had asked his help in explaining some maths problems they were having trouble with at school. But since they lived in different cities, Salaman Khan sent them several education videos that he had filmed himself. When he realised that they had actually been helpful for his cousins, Salaman decided they could also be useful for other teens struggling with maths. So he decided to share the videos on YouTube. The videos he had created for his cousins instantly became a viral education phenomenon.

He was so successful that MIT and the Bill and Melinda Gates Foundation decided to fund the creation of the Khan Academy, a non-profit venture producing educational content in the form of videos directly related with school curricula at no cost whatsoever. In 2013, Salaman Khan published *The One World Schoolhouse: Education Reimagined*. Khan re-imagines education in a world where his videos allow instructors to teach creativity and other skills necessary for the 21ST century instead of transferring information as students listen and take notes. But it looks like two chemistry teachers had beat him to the punch.

In 2007, Jonathan Bergman and Aaron Sams at the Colorado Woodland Park Institute in the US recorded some of the presentations they used in their courses. They originally thought only to help students who had been unable to attend class. However, they soon realised that if all students studied the lectures at home instead of in the classroom, the professors would have more time to develop projects, cater to the individual needs of students, prepare experiments, and prepare cooperative work.

The flipped classroom model was born out of this simple experience in Colorado, but it has quickly spread throughout the United States. Schools in the Summit Public School District have developed their own model, halfway between the steps model and the flipped classroom model by enlisting the help of Khan Academy.

Do it yourself: blended learning project

METHOD

➔ Hold a working session with other teachers in order to present the proposal. Use the design thinking tools that we learned a couple of sections back. Begin by asking questions like: How can we improve our students' learning by employing technology? How can we make technology work in favour of each student's success?

➔ Choose the years, courses, subject areas, and classes that will participate. Think big, but do not lose sight of the big picture. Begin step by step.

> **Begin by making the most out of the resources already at your disposal**

- ➔ Choose the teachers that will make up the team.

- ➔ Make sure you have the technical support and backing of your ICT coordinator.

- ➔ Determine which academic objectives you hope to improve in terms of those same groups' grades for the previous school year, or in terms of the previous class's performance.

- ➔ Let the families in on the plan. Help your case by showcasing the successful case studies presented in this chapter.

- ➔ Set up the third tier of your school's digital space. As we have seen, the most popular options are Google Drive, Moodle or Schoology, and Edmodo support.

- ➔ Begin by documenting activities and resources from the web that you can already use, and gather information about the tools at the disposal of the teaching staff.

- ➔ Identify the investment, and calculate the costs:

  - Begin by making the most out of the resources already at your disposal. For example, never leave the computer lab empty.

  - Invest in some 25 or 30 portable devices that can be taken to different classes.

  - As the plan advances and progresses, introduce the BYOD culture into the mix: Bring Your Own Device. This way, each student will be able to work with the device he or she brings with them.

- ➔ Start the project off in the classroom with concrete actions for the teaching staff that we will explore in following: blog, webquest, flipped, video and learning journals. Remember to give a fundamental role to this last item throughout the process.

- ➔ Measure the impact of evaluations, as well as the degree of the students' and their families' satisfaction.

- ➔ Share the success with the education community through all available means.

- ➔ Do not forget to find new material online and to share successful experiences with the whole school.

- ➔ Increase the number of groups, classes, subject areas, and teaching staff involved. Step by step, adjust the amount of time devoted to the PBL and group work.

  - Make sure to provide adequate PBL training. You can find a wide range of free courses at www.coursera.org, www.miriadax.net, and other open online platforms focused on the same topics.

BLENDED LEARNING

Disruptive methods are transforming the world of teaching with the replacement of expensive and complicated products with other cheaper, simpler and more comprehensive ones.

Combined learning is that which complements the physical presence of the student in a study centre with the following of online courses to complete the curriculum.

Models of combined learning

Face-to-face
A teacher is responsible for giving the subject on an online course or as a supplement to what has been explained in class.

Rotation
The students alternate between face-to-face lessons and the search for content.

Flexible
An online platform teaches most of the course. A teacher deals with any queries individually or in small groups.

Online laboratory
The students attend a study centre at which an online platform teaches the course.

Self-mixing
The students decide which online courses to follow to complete their curricula.

Online tutor
An online platform and a teacher give all the subject. The students working remotely with their teacher.

Improvements needed to enhance combined learning

Systems integration
It is necessary to achieve the assimilation of the online content which reaches the student from different sources.

Dynamic quality content
The subjects which are taught online must be adapted to technological standards which encourage this kind of teaching.

Analysis
The tutors of these subjects must have the ability to evaluate the content so that the teaching is as personalised as possible.

Automation
The tutors must be released from the tasks which are not purely educational, such as checking attendance and exam correction.

Applications which motivate
It is easier to motivate a student if social network applications, games, playlists, rewards, etc. are used.
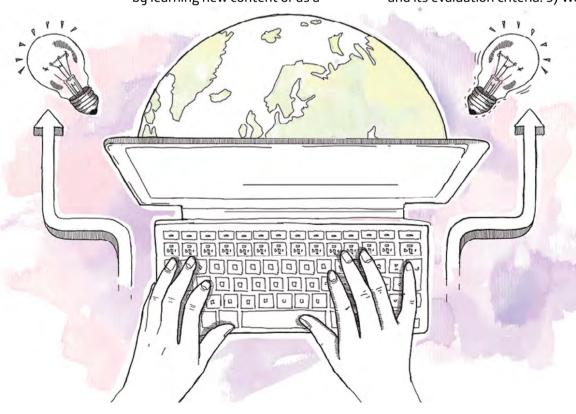
SOURCE: http://www.knewton.com/

What can I do at my own school?

ACTION

1 **Begin by writing your own classroom blog.** A blog is an online workbook that is open for all to see. Although many of the methods we have studied are built around modular digital spaces and often limit access to registered users with valid passwords, beginning by writing a blog is a good way of learning and sharing work with other colleagues or classmates online. For the most part, blogs tend to take on the form of a diary, but they can also be used as a library of resources having different tabs where podcasts, videos, or wikis can be published so students can work from home by learning new content or as a review. Each tab can correspond to a learning unit. Recall that Kunskapsskolan divides the content of each subject area into 30 units. Begin a content library for your own subject.

2 **Make a webquest.** Develop digital treasure maps. A webquest is a digital research learning tool that uses Internet resources. It focuses on task completion and on creating a final product by sharing evaluation criteria. In a webquest: 1) We present activities in context through real life examples and the reasons for learning it. 2) We showcase the finished product and its evaluation criteria. 3) We

LEARNING PLANS IN KUNSKAPSSKOLAN

- Individual learning plan for ....
- Tutors ....
- Specialised teachers ....
- Date ....
- Next test date ....

CURRENT SITUATION	FINAL GOAL	IMMEDIATE GOAL	LEARNING STRATEGIES	PROGRESS
In maths steps				
……				
In "English language" steps				
……				
In science steps				
……				
In "Swedish language" steps				
……				

> Develop digital treasure maps

sequence a series of tasks that guides the student. 4) Finally, we point to valuable online resources, videos or or web pages that the student must consult in order to complete assigned tasks and design the product. A webquest is a simple tool both for students and teachers whose objective is begin the personalisation of the learning process through technology. In this page I will show you a simple class planning worksheet. You do not even have to do the work online. You can work on paper as long as you have access to the necessary online research tools.

3 **Click play.** One of flipped classroom and Khan Academy's most important improvement tools are videos. Students nowadays are perfectly familiarised with videos. Khan Academy's five to seven minute videos, as well as those from TED-Ed, are an incredibly high-quality resource. Take a look at these pages and browse through everything you find useful in planning your class. What is more, you can create simple webquests on TED-Ed's web page with their excellent education videos. Blendspace is another wonderful free tool. Remember, if there is already a good video in your language talking about solving second degree equations or the fundamentals of microeconomics, you have two options: either use it, or learn from it and improve it.

4 **Supporting the learning process.** The secret to this personalisation and technology adoption model lies in the scaffolding constructed by

> Finding and organising adequate research and learning tools is a simple and efficient process if all the teaching staff members participate

students and teachers, which is based on their diaries or shared monitoring plans. When Moodle, Chamilo or Schoology organise content in modules, students and teachers frequently interact by sharing their accomplishments, demonstrating that they are taking part in the progress. The learning plans that we discovered through Sabina's experience in Kunskapsskolan also represent a great model for ensuring student follow-up through communication.

5 Community library.

Finding and organising adequate research and learning tools is a simple and efficient process if all the teaching staff members participate. If each teacher makes a small contribution by identifying and saving links for a common resource library organised by subject area, a school can have a wealth of suggestions, activities, and videos within a month, which will allow it to begin using blogs, webquests, or personalised modules. Spend two or three afternoons a week searching for online resources to build your third-tier library in your digital space. This small investment, shared by all who participate, can offer great benefits.

6 Adapting the learning process.

The flipped classroom or steps models can be personalised as each student begins to favour specific learning strategies. Learning objectives and tools will be adjusted as a function of:

- The grading of an evaluation tool: this can be a test, a presentation, or a project. According to the grade received, different activities or itineraries will be made available to different student groups. Those with better results can, for example, move on to a new webquest, while those who need to spend some more time on the same content can take on new activities and receive more personalised supervision.

- The result is an activity where students must successfully finish each step before advancing on to the next task. In this case, tasks are like different doors that can only be opened once the previous one has been closed. For example, students must first complete an activity outline before taking the activity test. Some doors contain mandatory basic content, while others are optional and can be completed for extra credit.

- At the student's own pace: each activity is an open door that the student will only cross when he or she decides, with teacher's help. The student can choose what activities to do as well as when to take the corresponding tests.

- Different combinations: we can combine some obligatory activities to be completed in sequence with other free activities that students can choose to complete at their own pace and in the order that they prefer.

BIBLIOGRAPHY

- John BAILEY, Carri SCHNEIDER, Lisa DUTY et al.: *Blended Learning Implementation Guide.* 2.0 Version. DLN Smart Series, 2013.
- OECD: *Inspired by Technology, Driven by Pedagogy. A Systemic Approach to Technology-Based School Innovations.* OECD Publishing, 2009.
- UNESCO: *ICT Competency Standards for Teachers.* UNESCO Editions, 2008.
- Clayton M. CHRISTENSEN, Michael B. HORN, and Curtis W. Johnson: *Disrupting Class. How Disruptive Innovation Will Change the Way the World Learns.* McGraw Hill, 2008.
- Cecilia FÄLLGREN: *Why We Choose Kunskap.* Kunskapsokolan Education, Sweden, 2011.
- Stephen HARRIS: *ICT Innovation Transforming the Heart of the Classroom.* SCIL Publishing, 2007.

LEARN MORE

Kunskapsskolan, Sweden

www.kunskapsskolan.com

Kunskapsskolan is an amazing Swedish education project that focuses on secondary education. In less than fifteen years, Kunskapsskolan has expanded to thirty-six schools in its home country, five in the UK, one in New York, and another in Gurgaon, India. In 2013, they achieved unbeatable results. Sweden's standardised test results have demonstrated that year after year, Kunskapsskolan students obtain better results than the national average. Kunskapsskolan focuses on designing learning experiences with concrete objectives for each week and term. These experiences are coordinated through the students' agendas and personalised learning plans.

Innova Schools in Peru

www.innovaschools.edu.pe

Peru has recently witnessed the emergence of a new network of schools that seeks to create an inspired, intelligent, and more ethical generation that will lead the country's way in the future. The keys to its success lie in its use of the blended learning model, the design of its classrooms, the teaching staff and a culture emphasising 21ST century values.

Colegio Santa María La Blanca, Madrid.

http://www.colegiosantamarialablanca.com/

Employing the Lezama Method, the EBI project is a model that pedagogically and administratively manages an educational centre in order to offer personalised teaching that caters to the specific needs of its students. The Lezama Method makes it possible to evaluate work being done in order to identify areas needing improvement in real time, and to establish means of improvement in every school year.

11. A VIDEO GAME CALLED CURRICULUM

⬈ Let's travel to New York.

⬈ We'll learn to get the most out of technology to create projects.

⬈ We'll understand the principles of game-based learning.

WATCH VIDEO

Learning through play

I n Mr Smiley's Masterchef course, students try to develop a menu for the school's cafeteria based on the region's agriculture. In order to accomplish their goal, students must learn the origin of different foods and decide what products to use at each time of year. In the last two weeks of the course, the students will prepare meals for the entire school, calculating costs and applying the knowledge they learned in maths and science classes.

Mrs Shapiro's course, The Wireless Imagination, helps students create their own radio programme. But the first thing they need is an antenna, so participants must learn how electricity works. Then, they will construct their own station, and put it to work in order to record and broadcast their own programmes and podcasts.

Mr Chau's Dungeons and Dragons course studies probability and descriptive storytelling. Of course, dragons and dungeons are also studied in the course, but they are actually just an excuse.

The three courses last six weeks, and are known as XPods, or term electives at the Quest to Learn institute, a school21 that has revolutionised its school community by relying on play and project-based learning.

There is no such a thing as maths, science, language, or natural and social science on Quest to Learn's class schedules. It is more common to find courses devoted to Well-being, The World in which Things Work, Codified Worlds, and other more exciting-sounding subjects, like for example:

Home Base. This is a moment at the beginning and end of the day when students go over their learning roadmap with their teacher in order to share their accomplishments and needs. Students form groups of ten where they take care of one another and share advice.

Discovery Missions. These last ten weeks, during which time, students work on several different subject areas through a single project, which is designed with play and technology in mind. Activities are divided into levels, where students win points (grades) and prizes. They may choose between different narrative paths, and the difficulty of the tasks increases at every step, like in Jonathan's research project called Private Detectives in Ancient Greece and Sparta.

Mission Annex. This is a time devoted to language and maths that aims to help students tackle the most challenging parts of their mission. It is also a space that allows teachers to adapt to the needs of groups that may require special attention. The annex takes place three hours a week.

Special Missions. For one hour a day, students decide what content to work on. They can also give presentations to their classmates, or design an activity on a topic of their choosing. Jonathan's favourites have been Lego and Robotics, Anime Reading Club,

> **In the last two weeks, students will be in charge of meals for the whole school**

League of Civilizations, and the Spoken Word conference model.

→ **Boss Level, final level or the level of a monster.** This module spans two weeks, usually at the end of term. During this time, students work in teams on a project intended for them to demonstrate their mastery of skills developed in previous missions, but this time with a greater level of difficulty. In a Boss Level, students learn by following a strict process of research, the construction of a theory, hypotheses and prototypes, continuous evaluation, and a final presentation. All along, teachers provide the students advice and guidance. In addition to the final presentation, the roles that students take on during the mission become very important, whether they take themselves to be writers, designers, engineers, ethnographers, producers, or private detectives.

→ **Finally, XPods or electives.** These activities change from year to year and external professionals are brought in to share the missions alongside students and teachers. This is the case of Mr Smiley, Mrs Shapiro, and Mr Chau.

Gamify the world

IDEA

At schools21, playing is not at odds with learning. Rather, playing is an essential part in the simple and exciting experience of learning. Playing means creating shadows and characters behind a lighted sheet, or building a story with QR codes as you discover hidden treasures in your own classroom. In the book *Science with a Conscience*, philosopher Edgar Morin wonders about nature, the cosmos and science, and concludes playfully that "play is not just learning such and such technique, such and such skill, such and such

> **"**
>
> Play is more than essential to learning, it is essential to life

know-how. Play is learning the nature of life itself, which is always playing with chance."

Play is more than essential to learning; it is essential to life, and in the last few years, technology has blown it up to incredible dimensions.

In 2010, Jane McGonigal published *Reality is Broken. Why Games Make Us Better and How They Can Change the World*. The title says it all. Convinced by the power of play and of its increased potential thanks to technology, McGonigal has spent years developing possible ways to transform the world by relying on video game participation, creativity and interaction. She is convinced she will achieve her goal.

In 2011, working alongside the universities of Stanford, Berkeley, Pennsylvania and Ohio, she developed Superbetter. It is an app where players determine their own goals in order to reach happiness and lead a more healthy life. Relying on simple steps, practical exercises, levels, points and awards, playing becomes the best way to achieve self-fulfilment, letting you be yourself but where you plan your own strategy through the game. Based on recent research into physical health and psychological well-being, Superbetter is a healthily addictive video game.

Tom Chatfield is a well-known author and digital analyst. In 2010, he published *Fun Inc. Why Games Are the 21ST Century's Most Serious Business*. Since then, his ideas about the way in which video games stimulate the human brain have been widely circulated. For Tom, video games:

- Measure development, experience, energy or wisdom with bars or simple points systems that are easy to understand and control.

- They offer graduated achievements; you can obtain few or many points, depending on you choose.

- They always reward every effort, no matter how small it may be, and they do it instantly.

- They provide constant, clear and quick feedback on one's development, which makes it possible to make mistakes and learn from them.

- They challenge players, which is very exciting for the teenage brain.

- They let the player know when it is necessary to focus, which is convenient for those hoping to obtain the best results.

- They can establish contact with other players, and ever more frequently, they rely on cooperative or social tasks that must occur in reality in order for them to have any effect on the screen.

Video games bring together activities that require concentration, creativity and problem-solving skills, all in a playful manner. In 2012, researchers Constance Steinkuehler and Sean Duncan analysed cognitive activity during a standard World of Warcraft game. To do so, they analysed gaming tendencies in over two thousand people as illustrated in game forums. The results of the study, to cite the authors, showed that "Video games are becoming the new hotbed of scientific thinking for kids today."

Replicating Quest to Learn

METHOD

How to design a game-based learning (GBL) experience? At Quest to Learn, each special mission, Boss Level or XPod is founded upon project-based learning methodology, to which the creative potential of games and technology is added.

➲ **Create a project with a story**. All video games have a certain narrative that gives them more meaning. These projects begin with a challenge and end with a product and its presentation. For PBL, we learned that its phases had to follow an order, as do the parts of a good story. For GBL, we also create the story. Narration drives the development using a story, an adventure or a fable that relates to curricular content. Dare to explore the human body from inside; travel to the north and south poles, to the desert or to the jungle; go around the world; travel in time; create zombies; write a script for a new literary, artistic or political film. Enhance your curriculum with a story.

● "Fear not: Ranger, Barbarian, Magician, Thief, Cavalier, and Acrobat. That was Venger, the force of evil. I am Dungeon Master, your guide in the realm of Dungeons and Dragons!" Those were the opening credits

> Narration drives the development using a story, an adventure or a fable that relates to curricular content

of Dungeons and Dragons, , and those are the roles that Mr Chau uses in his course. Recall the roles we discussed in the chapter on cooperative learning. The acrobat is a participation motivator, the archer directs people's attention to tasks at hand, the magician ensures order and timekeeping, while the knight guides the group. Role playing is essential in GBL. It helps students concentrate on the story, and moreover, it establishes concrete functions for each player that ensure groups work well together. Create your roles with researchers, historical characters, inventors, artists, explorers, or adventurers. Inspire yourself with educational content.

- One language, but another tongue. The symbolism and narrative you have chosen for your video games must permeate GBL sessions. The phases of the project may be called levels or, if we're embarking on an adventure, journeys on a map. The map can become a personalised itinerary full of new encounters with new characters, "monsters" or evil villains we must confront in the form of tests and evaluations. There may be problems, treasures, duels, points, bases, jails, jokers, galleons, arches, arrows...

- Energy bars may serve as an evaluation tool. Make sure to share evaluation criteria and indicators with students from the beginning. Clearly explain how each of the project's parts are evaluated, what they consist of, and how the final grade will be calculated. It is important for students to know at all times what mission level they are at, as well as their evaluation results thus far. Just like in a video game, constant feedback on one's condition is important. Help yourself to similes like the energy bar that video game characters tend to have. You may just as well use thermometers, pie charts, rulers or other visual representations of evaluation.

- **It is not magic; it is enhanced reality.** Digital resources allow us to open our projects to spaces that merge reality and the screen. Enhanced reality is the term used to refer to these spaces of permeable borders between the physical and the virtual, where transmedia narrative makes more sense. Thanks to enhanced reality, we can see otherwise invisible elements that we discover by using cameras and other applied digital technologies, which results in a form of mixed reality: a space with real and virtual elements that we perceive through technology. Using apps with QR codes and new Aura creations makes it possible to enrich the GBL model with shared activities that contribute realism and emotion to the story, all thanks to technology. With a simple image drawn on a piece of paper, we can create castles, modern buildings, constellations, 3D images of the human body or of nature, with mountains, waterfalls, and animals. We can also generate videos or assemble a large body of information.

> " It brings together real-world activities and web activities in order to create a transmedia narrative

Bringing two worlds together: the real and the virtual One of GBL's main assets is its capacity to integrate technology through tasks that do not require digital development. In this way, it brings together real-world activities and web activities in order to create a narrative that brings together the screen and reality. For example, it is possible to measure real objects that are later represented in digital graphs; to write screenplays or speeches that are later acted out, performed and recorded by classmates; to access information with a QR code in order to finish a written task; to ask questions on social networks in order to obtain information for class participation, etc.

Tracing new paths. You can allow students to choose different paths on the treasure map. In any GBL, compulsory activities related to required curriculum content must be contemplated, but at the same time, there is space at every phase to choose from a range of activities that award different numbers of points according to the level of difficulty.

Rewards and badges. Badges represent achievements with images or icons. For any GBL project, it is necessary to create diverse and original rewards for its activities. Many of these awards are digital, but they can also be offered on paper. The most important thing is for them to be different and for there to be a lot of them. It is also ideal for the badges to be related to the story's main topic, and for some of them to be displayed clearly alongside certain activities, while others should remain hidden and should only become visible when certain activities are completed, which the teacher can inform on day to day.

The digital toolbox. In Quest to Learn, each presentation map and worksheet provided to students has a Smartoolbox. When the teacher designs a mission, he or she fills this back-pack with the digital tools that the student's avatars will need in order to complete their objectives successfully.

This toolbox is important because it lets students know about the applications and programmes they will need in order to complete mission activities that involve technology. The equipment in these Smartoolboxes takes its cue from the TPACK technology integration model. TPACK is a model based on the intersection of three domains:

- Technology, related to programmes and digital devices (TK).

- Pedagogy, which consists in educational and teaching know-how (PK).

- Content, which corresponds to each area and project; that is, to knowledge (CK).

Quest to Learn has created its own set of tools related with the sort of activities that tend to take place in the classroom. It is like having a digital backpack on at all times. This is how they design more quickly and in light of their own experiences, which improve at each step.
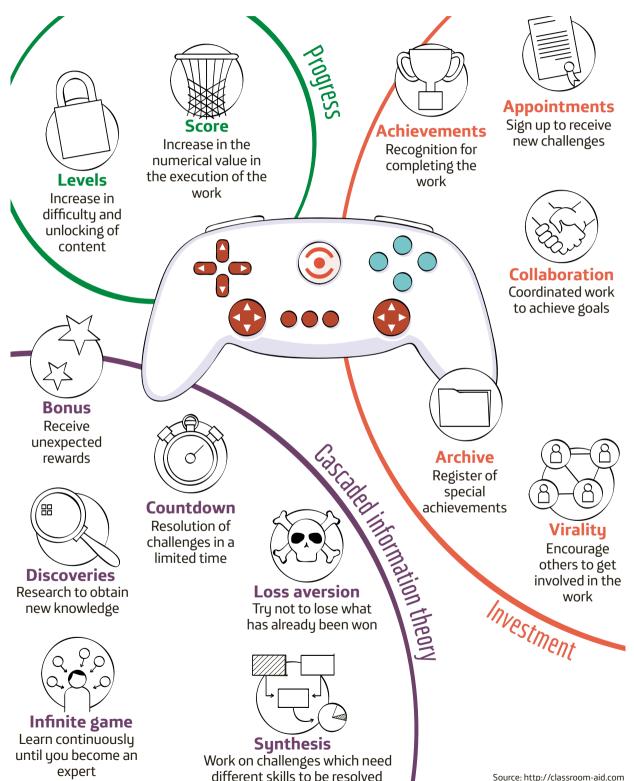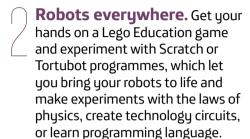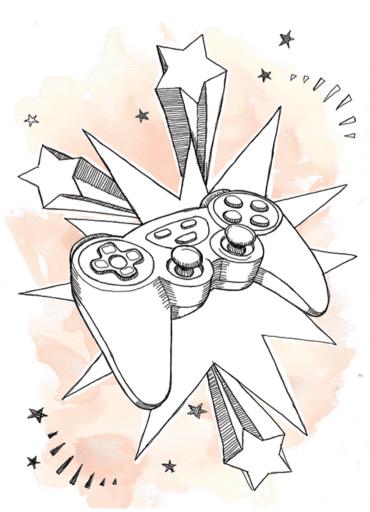
WHAT CAN BE LEARNED FROM VIDEO GAMES?

Progress

Levels
Increase in difficulty and unlocking of content

Score
Increase in the numerical value in the execution of the work

Achievements
Recognition for completing the work

Appointments
Sign up to receive new challenges

Collaboration
Coordinated work to achieve goals

Bonus
Receive unexpected rewards

Cascaded information theory

Countdown
Resolution of challenges in a limited time

Loss aversion
Try not to lose what has already been won

Archive
Register of special achievements

Discoveries
Research to obtain new knowledge

Virality
Encourage others to get involved in the work

Infinite game
Learn continuously until you become an expert

Synthesis
Work on challenges which need different skills to be resolved

Investment

Source: http://classroom-aid.com

What can I do at my own school?

ACTION

1 The video game museum. Collect old computers and game consoles from students and teaching staff, and place them strategically throughout the school with education content games. In the playground, in the hallways, at the entrance… there are hundreds of video games that can be used to learn or to support learning. You can create a museum around them, offering a guided visit or even a cultural week.

2 Robots everywhere. Get your hands on a Lego Education game and experiment with Scratch or Tortubot programmes, which let you bring your robots to life and make experiments with the laws of physics, create technology circuits, or learn programming language.

3 Open the door to any teacher in the world. Thanks to programmes like Skype or Google Hangouts, it is possible to set up video conferences with people from halfway across the globe at no cost. Don't limit yourself when technology does not limit you. Try having conversations with singers, writers, and teachers in other countries who speak different languages, who will contribute live to our own learning. The world is huge, and technology allows us to open a window to any part of it, right from our classrooms.

4 Spread the positive attitude. Let other teaching staff members know about what works well in ICT. Using the school's own ICT lab, you can broadcast its successes, and generate sequences that work in the classroom. The best way to convince others is not to try to convince them, since ICT's positive spirit dies off when it becomes an obligation. Showcase the process and the results of its students, and create simple guides that allow other teaching staff members to replicate the experience. First they will copy, and then they will integrate the principles and propose their own activities.

BIBLIOGRAPHY

- **Lyndsay GRANT**: *Developing the Home-School Relationship Using Digital Technologies.* Futurelab, 2010.

- **Salman KHAN**: *The One World School House. Education Reimagined.* Hodder, 2012.

- **Ruben R. PUENTEDURA**: *Paths to Transformation: Putting SAMR and the Horizon Report to Work.* Hippasus.

- **Ruben R. PUENTEDURA**: *21st Century Literacies: A Look through a Technology Lens.* Hippasus.

- **Katie SALEN** et al.: *Quest to Learn. Developing the School for Digital Kids.* MIT Press, Cambridge - London, 2011.

- **Mary ULICSAK, Ben WILLIAMSON**: *Computer Games and Learning.* Futurelab, 2010.

- **Patricia WASTIAU, Caroline KEARNEY, Wouter VAN DEN BERGHE**: *How Are Digital Games Used in Schools?* European Schoolnet, 2009.

LEARN MORE

Quest to Learn, New York

http://q2l.org

Gamify your curriculum with Quest to Learn's experience. At Schools21, playing is not at odds with learning. Rather, playing is an essential part in the simple and exciting experience of learning. Playing means creating shadows and characters behind a lighted sheet, or building a story with QR codes as you discover hidden treasures in your own classroom.

Katie Salen is an interactive video game and systems designer at the Institute of Play, the institution behind the Quest to Learn project since its inception in 2009.

Summit Public Schools, California

http://www.summitps.org/

Discover the blended learning model in California. The *steps* method in Kunskapsskolan, iZone's blended learning method in New York, the Khan Academy or the flipped classroom; these are some of the initiatives that have helped personalise learning thanks to technology, taking the student as the protagonist of each one of the activities they propose.

They stand out for their capacity to adapt to different learning paces, for the possibility they afford to use their material at any time and any place, and for needing teacher follow-up in the form of dialogue that ultimately builds learning in conjunction with continuous evaluation processes.

SOLE, a school in the cloud

http://tedsole.tumblr.com/

SOLE, Self-Organized Learning Environment, is a method that Sugata Mitra has been developing for years and that in 2013 won a TEDPrize to construct

a school in the cloud. It is a school that any child in the world can attend by going online and thus learn by him or herself, or alongside his or her classmates.

12. THE THIRD TEACHER

⊿ Let's travel to Buenos Aires

⊿ We'll discover the education principles that guide the layout of schools21.

⊿ We'll learn to redesign a classroom with ten low-cost proposals, and we'll create new metaphors in order to get the most out of our building's forgotten nooks and crannies.

⊿ We'll find out the logic behind workshops, camp-fires, caves, water fountains, and other education designs within our reach.

WATCH VIDEO

JOURNEY

Aletheia, learning by unveiling art

Buenos Aires is the catharsis of three million Argentines. The neurosis of Buenos Aires is singularly healthy; a psychopathology yet to be diagnosed. Wisely disorganised, this city makes you ready to be happy.

Buenos Aires accompanies and imprints itself in you. You are its space. The city contributes to every new experience and ultimately frames your life. Diagnosed with this creative and healthy syndrome, we head towards number 1347, on the never-ending Gallo Street. There, lodged between far taller buildings stands Aletheia school, a small but serene building.

Its classrooms and playground are filled with huge toolboxes and other objects that pump life into learning. Traditional posters, glue and markers can be found everywhere, but also elements of nature such as twigs, rocks, leaves and Gaboon wood, but also empty yoghurt packages and other waste that has now come to life, including glass and washers.

The school has its own identity, the identity of the teaching staff and principal María Victoria Alfieri, who welcomes me in her office to explain all of this that, without words, the walls already tell you about their classrooms. They talk to you differently, radiating learning, and with the language of love at first sight that was born out of the encounter with Reggio pedagogy.

Spaces that guide learning

IDEA

The **workshop** is the best space for experimentation, research and exploration. In a workshop, children's voices are heard above all others, which grants them freedom in their creative processes. Students are in the company of teachers and workshop leaders who compliment the curriculum and the expression in the more than a hundred possible languages of expression during childhood. The workshop is a space of learning where bridges are built between artistic creation and the contents of the curriculum.

The workshop is a great open studio, full of possibilities and elements, all within the student's reach. It is a mix between sewing kit, toolbox, glass shop, carpenter store, and paint studio, all well-mixed and on a small scale. With the years, Reggian schools all over the world have developed workshop spaces for each classroom or level. Workshops awake creativity and expression as they incarnate the contents of the curriculum. All curriculum content is alive, and it only ever dies when we use passive presentation tools that sacrifice it.

The workshop is a great space for students to express themselves, experiment and record their results. It is the space that defines us by guiding our creativity. In a workshop, we are all creative. The design of the space and the composition of its element are what guide us.

Pedagogical documentation is, at the same time, the process and the space created by teachers, which is born out of listening to students. Teachers record projects with images, photos, notes, videos, etc. They bring continuous and qualitative evaluation to life.

Documentation constitutes the space, which is designed by recording the learning process with posters, notes, and all sorts of tools, analysing the steps of every project. This is why it is shared, and never takes place in the staffroom. By representing the project in space, the improvement of teaching practices becomes possible through the process of sharing reflections with colleagues, parents and students.

Documentation is written and photographed, drawn or recorded, filmed or outlined. This is the process that makes evaluation a dialogical and participative learning experience. Within the documentation, there are several living signs of the final product, since it converts the whole process into a product and creates a reflective routine for teachers. In this way, they may rediscover the most important milestones during the understanding of the curriculum content.

In **the exhibition**, learning comes to life. It is the shared unveiling for teachers, students and parents alike. The exhibition is the presentation of the results from the workshops and projects. It is a milestone that turns the school into an active workshops throughout the year and into a shared museum for the community at the end of each school year. It gives value to its products and it allows the teaching staff to emphasise the importance of method and process in learning.

> **"**
>
> Spaces configure and define us. They are, alongside students and educators, the third teacher

The exhibition is the organisation of the evidences of learning displayed in an original manner and commented by the students themselves as protagonists. In the exhibition, beyond making the products of learning public, a different form of unveiling takes place which surprises visitors in the narrative that guides them.

The exhibition recovers the constructive voice of learning in our students. When they participate in the exhibition, the children recognise themselves in their products, and they reminisce over the processes, creating a live education model, which is also dialogue, communication and grade-based, not in terms of punishment but also in its capacity to enrich and, ultimately evaluate. In the design and exhibition of his or her presentation, the child takes centre stage. He or she becomes an artist and an editor, a creator and creative talent.

The spaces of Alethia are endowed with educational identity. Originally they were courtyards, meeting rooms or hallways, but their own transformation has caused these spaces to grow in sync with the project.

Where once stood a meaningless and closed courtyard, there is now a workshop overflowing with creativity. On the other hand, once sterile meeting rooms are now the gathering place for documentation, with an explosive and collaborative design that makes teachers' work easier. Finally, the hallways have disappeared; they do not exist. They are now exhibition halls and displays of learning, because the hallway is a place to learn and not to walk through.

In schools21, space educates and is geared at making learning easier. Intelligent space design is a new teacher in the 21ST century. Spaces configure and define us. They are, alongside students and educators, the third teacher.

Designing multi-purpose spaces

> Success in experimenting with school design has resulted in the creation of three multi-purpose spaces. We're talking camp-fires, water fountains and caves

Schools21 revolve around learning. Their spaces do too. A meeting room encourages pedagogical documentation thanks to the layout of the tables, the possibility of marking up the walls and windows, the availability of various office supplies to label and record with markers, not to mention reams of paper, post-its and other simple but important elements.

In the last few years, the successful experimentation in school design has resulted in the creation of three multi-purpose spaces that can now be found in a good number of schools21 all over the world, and that have been applauded along the way. I'm talking about camp-fires, water fountains and caves. It was David Thornburg that came up with the three names (don't look at me...).

⮞ **The camp-fire** is an area devoted to presentations and talks. This is the perfect space for storytelling, artistic expression and content transmission. It is a small auditorium composed of three, four or five tall steps where students can sit down and listen to a communicator. There are usually some cushions and a screen available, although not necessarily. It may occupy its own classroom, but it is often located in corridors, libraries or playgrounds. Therefore, it can be indoors or outdoors. One of the most important things to keep in mind when designing camp-fires is that students must be able to sit in a half circle, or around an angle greater than 90°. Camp-fires tend to concentrate attention on the person standing at the centre.

⮞ The **water fountain** is a space devoted to meetings and socialisation, as well as teamwork. Water fountains are characterised by the use of round tables surrounded by chairs. They tend to be found in corridors and the best lit or heavily transited spaces in the community. They are placed for all to see and students are given complete freedom in their learning through them. They are good for individual work as well as teamwork, not to mention enjoying free time and chatting. Water fountains are the best way of turning hallways into traffic areas devoted to learning. Conquering the hallways, along with the teamwork they promote, increases learning possibilities and extends space beyond the classroom.

⮞ Finally, **the cave** is a place designed to work individually. A cave is an individual couch beside a window with a small table. It is a room full of large pouffes where students work individually. Caves are interior spaces that often are places next to well-lit areas like windows or balconies. Any space with a comfortable chair, cushions or a couch invites students to work individually. If they want to chat in groups or pairs, they know they must go to the water fountain.

Super-classrooms

Super-classrooms are large learning spaces far bigger in size than traditional classrooms and are devoted to promoting autonomous and varied learning experiences.

The design of a super-classroom follows the guidelines that bring together the most important tenets of 21ST century education. It allows students to choose spaces, tasks and times, and combines cooperative strategies with individual work. The design provides for students' autonomy, yet it also ensures professors can give them the

necessary support. It challenges students and integrates other dynamics that provide balance to its functioning. A super-classroom is a learning system that self-regulates thanks to the methodology and integration of the digital structure found in schools21.

When we visited the Sydney Centre for Innovation in Learning, we discovered first hand an optimum planning model for a type of learning with these characteristics: the multiple intelligence matrix and Bloom's taxonomy. But super-classrooms are

> **On average, super-classrooms tend to host three different classes at a time, which allows for three teachers to be continuously present**

also an ideal space to develop each and every one of the methods we have come to know along our journey.

On average, super-classrooms tend to host three different classes at a time, which allows for three teachers to be continuously present, if not four, depending on the schedule, educational needs and the subject areas concerned. However, although it may seem so, super-classrooms are not an economic solution designed to introduce more children into each class and reduce costs.

Super-classrooms were born as a space that defines its structure in terms of these principles, which may be represented as:

- A large, open central space.

- The organisation around several different poles or corners that gain functionality from the objects they contain.

- Specific material and resources to complete a task.

- Individual areas with pouffes or desks.

- An interactive digital board.

- Blackboard walls suitable to be written on.

- Walls to hang up finished work.

- Spaces for individual student-teacher dialogue.

- Areas with couches and cushions, or tables arranged in groups.

- Boards to present evaluation processes.

- Flexibly furnished, arranged at the students' disposal.

- Mostly transparent walls and no internal divisions.

- The possibility of having warmer or more homely spaces in order to work without shoes, or sitting and lying on the ground.

- At least two screens to show student work or images related to activity content.

Experiences within a super-classroom begin from the inside out, which means that students and teachers first get together in the centre to establish certain guidelines for the pace of working then answer any questions, and finally, explore the space together. At the end of class, the movement flow in the opposite direction, from the outside poles towards the large inner circle to finish the activity. Super-classrooms work within large blocks of time. They are easy to make work with primary school schedules with 80 or 100 minute sessions (for secondary school, we'll discover modular scheduling before finishing the chapter).

The three teachers that guide the activity must be very attentive to each student, but it is common for them to divide up three different roles according to function. One teacher leads the session and guides the planning. Another is devoted to those students who may have questions, difficulties or that get stuck in a given activity. Finally, a third teacher makes curricular adaptations and helps students with special needs.

Designing a standard classroom

METHOD

⊙ **Involve students in the process.** Help yourself with the design thinking tools: How can we improve the design of our classroom? How can we design a space that promotes learning? Do some research, record your results and showcase the school21 classrooms we have encountered in this journey, ones that open their doors to you on their web pages. No doubt with the help of your students and these experiences you will be able to expand your own list of effective strategies.

⊙ **Arrange the tables in teams.** Promote cooperative learning. Remember the roles and indications we have studied in previous chapters. Tables in rows no longer make any sense. Focus on the work at the centre of each table. This is where knowledge grows.

⊙ **The walls are blackboards.** Use adhesive vinyl and board paint in order to expand your wall possibilities. Make new boards or rolls of paper that compliment the traditional chalkboard and allow students to use them with markers in different activities. Use at least one large wall as a vinyl whiteboard, or even more inexpensively, use paint that you can write chalk on and later erase. Large boards are great flexible, multi-purpose spaces for drawing, designing, decorating, etc.
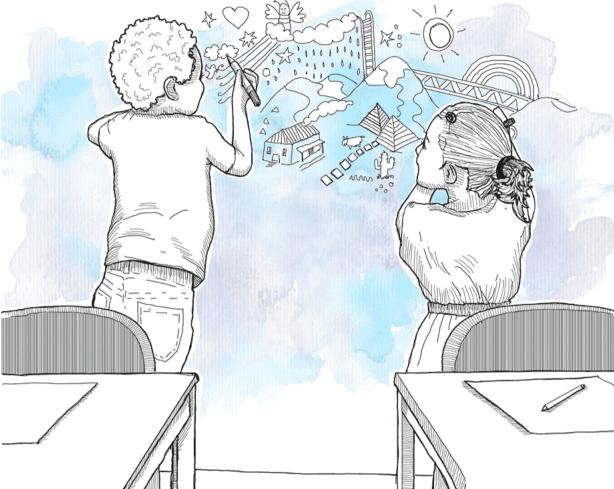
⊙ **Open a digital window.** You need a screen, an interactive digital board or a simple wall in which the classroom's digital dimension can be projected.

⊙ **Use the entire wall and all the walls.** Walls are great surfaces which we often do not get the most out of. If you cover a wall with vinyl paper, it is very likely that you will have space left over near the ceiling. Use them to write optimistic phrases, popular sayings, school mottoes or classroom rules, designed by the students themselves.

⊙ **Decentralise the focus of attention.** Install wheels on your desk; minimise your space. In many schools21, the teacher's desk is tall, has wheels and comes together with a tall stool with a seat back. It is important to mingle with the students and shine the spotlight on each group and each person. Help yourself to decentralise the classroom's linearity by creating at least three poles: one on the digital building, another on one of the boards, and another on each of the tasks on the group tables.

⊙ **Conquer the corridor.** Corridors are learning spaces when we dress them that way. Many activities can take place in the hallway, which lightens the load on the classroom. Use camp-fires, water fountains and caves in order to accompany your activities and expand the classroom.

12. THE THIRD TEACHER

> **Windows can also be painted on**. Use windows as a space for writing with markers. Encourage students to explain their ideas and create mental maps using *post-its* and other strategies in the process. Do not forget that windows are also education spaces.

> **Create "clothes lines".** You can hang thin lines of string or fine rope in order to hang up drawings and other student work from one side of the classroom to the other, or along the wall. They are very efficient because while the walls become your new boards, the "clothes lines" allow you to liven up the space with images and each week's projects. Moreover, they are easy to change thanks to clothes pins, which are far better than tacks or pins.

> **Pay attention to the lighting.** Many classrooms have fluorescent lights that shine in a horrendous manner, and are sometimes focused on just a few spots. The intensity and effect improve when we cover these lights with sheets or light coloured fabrics. With this simple trick, the light becomes clearer and more natural.

What can I do at my own school?

ACTION
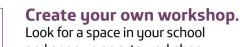
1 Create your own workshop.
Look for a space in your school and open up an arts workshop. Maybe you can begin with the art room, or with a common area where you have access to materials for drawing, cutting and glueing, etc. It doesn't have to be a large space, but if you have access to more than one, all the better. Do it as a curricular activity, not an extracurricular one. Let students express themselves about contents through art. Definitively explore each of the curriculum's areas. Art is not just crafts.

2 Redesign your classroom.
It is the place where you spend the longest part of your day and a great part of your life. Take advantage of the ten tips we showed you in this chapter in order to make space stimulate learning. Discover the new classroom hidden within its walls. Do not forget to take a photo before and after the makeover, and share it with the entire world to appreciate the differences.
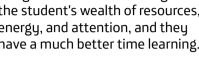
3 Project yourself in art.
With or without a workshop, the visual and plastic area is one of the best-suited places to carry out an interdisciplinary project. If you put two hours of the schedule together, you gain time and join two teachers who can work on the same content at the same time to create projects on the seasons, images of the human body or the states of animal and plant transformation, for example. The art teacher will give his/her input on technical aspects, while the other teacher can guide the content. You gain the student's wealth of resources, energy, and attention, and they have a much better time learning.

4 Welcome to the independent republic of your school. Redecorate your school. Different spaces can inhale learning and exhale teaching. Walls, playgrounds, floors, cafeterias, lounges, stairways… any space is suitable for displaying examples: classroom projects, photos, and all kinds of elements that showcase the work taking place in the classroom. Keep only the absolutely essential ones, and get rid of posters that were not created by students and teachers from your school. Each year, present new proof of learning in hallways and classroom walls.

5 Get rid of hallways. Since you are already redecorating, do not forget to make every space functional. Places exist for whatever purpose we use and design them for, and vice versa. The use we give to a particular space should not depend on its structure. Structure is easy to transform with a few small details or new usage. Hallways are the least exploited space in the whole school. You can use them to work, present, do activities that require movement, etc. Your school determines the function of the hallways, which are as versatile and useful as you can imagine. Create your own water fountains and caves.

BIBLIOGRAPHY

- **Giulio CEPPI, Michele ZINI** [ed.] **et al.**: *Niños, espacios, relaciones: metaproyecto de ambiente para la infancia. [Children, Spaces, Relationships: Environmental Metaproject for Childhood].* Red Solare de School of Art and Communication S.R.L., Buenos Aires, 2009.

- **Stephen HEPPELL et al.**: *Building Learning Futures. A Research Project at Ultralab within the CABE/RIBA "Building Futures" Program.* 2004.

- **Prakash NAIR, Randall FIELDING and Jeffery LACKNEY**: *The Language of School Design. Design Patterns for 21ST Century Schools.* Designshare. com, 2009.

- **OECD**: *21st Century Learning Environments.* OECD Publishing, 2006.

- **OWP/P Architects, VS Furniture and Bruce Mau Design**: *The Third Teacher. 79 Ways You Can Use Design to Transform Teaching and Learning.* Abrams, New York, 2010.

- **Diana G. OBLINGER** [ed.]: *Learning Spaces.* Educause, 2006.

LEARN MORE

Loris Malaguzzi International Centre, Reggio Emilia, Italy

www.reggiochildren.it

In the 30s, the municipality of Reggio Emilia generated a different school model for its nursery and primary school students that today can be found around the world in schools21 from Korea to the US and Northern Europe to Australia, and has become highly popular in South America in the last few years. Recently, the community has grown up along with Loris Malaguzzi International Centre's proposals and the Reggio Children network.

Aletheia, Buenos Aires, Argentina

www.colegioaletheia.esc.edu.ar

Aletheia is a school which has existed for over 40 years. Originally a nursery school, ground-breaking in its time during the dictatorship and repression, it continued growing until it became what it is today. The Aletheia School is a discoverer of pedagogies. It is a true school of learning unveiled through art. More than poetry and prose, more than paintings or plays, it is devoted to awakening the talents that lie within each one of us and convert them into expression. The Reggian approximation is a philosophical and pedagogical perspective, not a method or a set of rules, but rather a certain way of understanding children and their learning process.

Vittra Schools, Sweden

http://www.vittra.se/

This network of schools in Sweden has called upon designer Rosan Bosch in order to revolutionise its learning spaces. The designer's spaces are one-of-a-kind, colourful and smart, coupled with a unique education project offering more autonomy and dialogue between students and teachers, make of these authentic schools21.
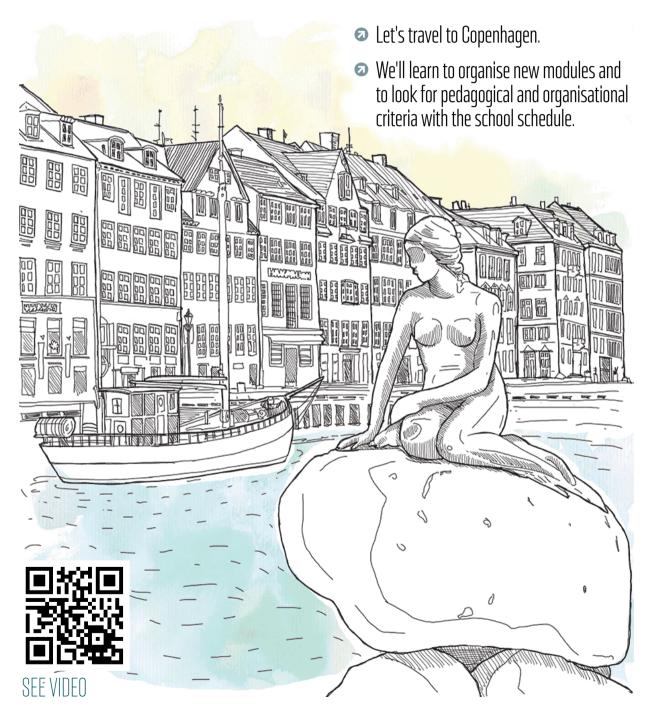
13. SIMPLIFYING SCHEDULES AND MAXIMISING LEARNING

◉ Let's travel to Copenhagen.

◉ We'll learn to organise new modules and to look for pedagogical and organisational criteria with the school schedule.

SEE VIDEO

The great staircase of educational innovation

JOURNEY

Morten Smith-Hansen welcomes me with open arms at Ørestad Gymnasium in Copenhagen. The exterior of this school21 is a glass cube with coloured scales that control the lighting. The oranges, yellows, and blues are its marks of identity. Everything inside is transparent; see-through glass walls and an enormous spiral staircase supporting and linking the building's eight floors. The colour white, glass and wood represent the DNA of the school's learning chain.

This school21 is one of the world's most avant-garde schools. The autonomy Ørestad Gymnasium has given to learning will make it immortal. Generations will come and go, but innovation will always have a place on one floor or another in this spectacular conch shell.

Morten Smith-Hansen is Danish, but he signs his e-mails as Martín. He is a Spanish teacher, and speaks the language better than I do. Together we climb up and down the stairs as he greets students of all ages. He tells me about what it's like to learn in a space where everyone is visible all the time. "Very simple", he tells me, "it's a matter of methodology and time management". The design of Ørestad Gymnasium promotes communication, dialogue, gathering and observation in the search for inspiration.

I see students working in groups everywhere. Cooperative learning takes over most of the space. However, I can't identify the teachers. There are also many students working alone, in chairs, focused on their books and on the screens of their devices. "They're probably studying during their free time", notes Morten, "some days in the week, between modules, the students can choose what to do and they normally invest their time in finishing projects, studying or doing teamwork. They have free time, and we give them autonomy for them to learn how to become responsible".

A matter of timing

IDEA

At Ørestad Gymnasium the schedule is divided into four modules, and each module lasts 100 minutes. In these modules the teacher can work by projects or choose another methodology. Either way, teachers find support in their digital building. The digital facet of Ørestad Gymnasium was perfectly tailored to a typical school21, which means, it can let students move freely and choose the floor they would like to work.

What is more, presentation and transmission times differ from module to module, as well as the times allocated to group and individual work. In this way, the design of the schedule, and not only referring to the space or methodology, mediates student and teacher behaviour.

Schools21 opt for simple schedules with the aim of maximising learning. In order to achieve this, they find support in digital structures, the PBL methodology, and continuous and varied forms of evaluation. Simple schedules give new identities to the space. Time is designed into a modular schedule that ranges between 80 and 100 minutes in duration. Each module is optimised according to pedagogical criteria.
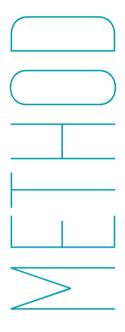
Designing the internal clock of your school21

METHOD

All educational systems in the world have a curricular order for the official content of their subjects and areas. In the secondary education of most countries, this design is particularly extensive, on average having more than ten different areas. There are many possibilities of combination. The most common ones revolve around modules such as:

- Emotional, social, and personal projects (such as My world) with tutoring, civics, religion or civic-ethical education.

- Discovery of the world and the social sciences, with geography, history, religion, or civics.

- Art: your expression and their expression, with computer science, fine arts, visual arts or music.

- Communication, coding and digital design, with technology and computer science.

- How do humans work? How does the world work?: nature and the scientific method, the natural sciences, biology and geology.

- The world speaks, with foreign languages.

- Chemistry and the physics of life, with physics, chemistry, and computer science.

- Communication, with Spanish, literature, the regional languages, and computer science.

- An ancient world, a new world, with Latin and classics.

What can I do at my own school?

ACTION

1 **Opt for modular organisation.** Schools21 have opted for longer sessions on their road to transformation. The average period lasts 90 minutes and is supported by PBL or by scheduling such as matrices or palettes. There are six different scenarios for their development:

- **Scenario 1.** A special week. It is the simplest model for the beginning of the transformation. Once or twice during the term, schedules change for a whole week,

> "
>
> Many schools21 are encouraging autonomy in learning by giving students moments of complete freedom

giving more prominence to projects and giving spaces more autonomy. It is a practice that allows for reflecting afterwards and the development of more complete scenarios.

- **Scenario 2.** Project day. This model has been largely implemented by the Big Picture Learning school network. They have termed the last day of the week "Project Friday". Every Friday the schedule becomes modular and project-based. This initiative seeks to bring students and teachers together, and does not imply a radical transformation. It encourages an evolution towards more integrated models (such as the following).

- **Scenario 3.** A part of the curriculum. This model implies dividing time into two, three or four areas. A simple beginning for an unhurried transformation that does not affect all the teachers. The areas are grouped into the similar modules that we have looked into earlier.

- **Scenario 4.** Time slots. Modules are introduced in the morning, during the day or at the end... and the design is sustained throughout the week, or at least for three days during the week. This model engages more teachers and makes the whole school advance towards its transformation goals. Schools21 tend to prefer this model in order to balance large projects with other more traditional subjects .

- **Scenario 5.** Spaces for free choice. Many schools21 are encouraging autonomy in learning by giving students moments of complete freedom. As at Ørestad Gymnasium or in the Kunskapsskolan network, students can freely choose how to invest their learning time within the space of two or three weekly modules (of at least one hour of duration). The centre is fully opened and everyone looks for a suitable space.

- **Scenario 6.** The whole year and the whole curriculum. This is the case of High Tech High and of Quest to Learn. These institutions have completely turned their curriculum schedules upside down.

2 Opt for methodological criteria. Don't let content exclusively guide the way in which you divide your time. Support teachers so that in each module they will have:

- An open group strategy that focuses on module guidelines and compiles previous achievements.

- Moments for clear, direct and brief content transmission.

- Time for cooperative group work.

- Spaces of individualised advisement supported by tutoring among equals.

- A group strategy for closing the module, focused on the main concepts, and on giving updates of the work achieved by each group.

BIBLIOGRAPHY

- **Stephen HARRIS**: *The SCIL Story: Embedding Research and Innovation into Everyday School Practice.* SCIL Publishing, 2010.

- **Beatriz JARAUTA, Francisco IMBERNÓN** [ed.]: *Pensando en el futuro de la educación Una nueva escuela para el siglo XXII. [Thinking about the Future of Education. A New School for the 21st Century].* Graó, Barcelona, 2012.

- **Charles LEADBEATER, Annika WONG**: *Learning from the Extremes.* Cisco, 2010.

- **Mona MOURSHED, Diana FARRELL and Dominic BARTON**: *Education to Employment. Designing a System that Works.* McKinsey Center for Government.

- **OECD**: *The Nature of Learning. Using Research to Inspire Practice.* OECD Publishing, 2010.

- **Insight Labs**: *Disrupting the Discourse; an Insight Labs Inquiry into the Rhetoric of School Reform.*

TO LEARN MORE

Ørestad Gymnasium, Copenhagen, Denmark

www.oerestadgym.dk

This school21 is one of the world's most avant-garde schools. The exterior of this school21 is a glass cube with coloured scales that control the lighting. Everything inside is transparent; see-through glass walls and an enormous spiral staircase supporting and linking the building's eight floors. The colour white, glass and wood represent the NA of the school's learning chain which integrates variety and freedom of choice in schedule and working time of the older students.

Green School, Indonesia

http://www.greenschool.org/

Known as the greenest school in the world, the Green School is as much part of the jungle as the jungle itself. This school in Bali, completely blended into the ecosystem, is built of reeds, trees and wood, and uses elements from nature as learning tools. They have adapted their schedules to the rhythm of the nature surrounding them in order to accomplish the goals and cornerstones of their educational project: sustainability, respect for the environment and the Earth, and student and learning focused methodologies, from early childhood education straight through secondary.

Fuji Kindergarten, Japan

http://fujikids.jp/

In the shape of a velodrome when looked at from above, this incredible kindergarten is specially designed for young children. Trees for climbing and hanging, a roof for running in circles, and slides that bring children into the classroom after the race. It is a kindergarten which does not have any limits regarding space or schedules. Takaharu Tezuka has gone down in the history of architecture, mainly for his ability to implement designs that fit well with both students' and teachers' needs. Many consider this to be the most incredible kindergarten in the world.

14. WE ARE ALL IMPORTANT

⊘ Let's travel to Montevideo, Barcelona, Santiago de Chile, and Victoria in Australia.

⊘ We'll learn how to set up student elections and processes of democratic participation in the organisation of schools.

⊘ We'll look at some of the key activities in learning communities.

A country that feels like a community

Uruguay is a country of small houses and Montevideo is its capital. Raised among the "Goliath" countries of Brazil and Argentina, it learned to make itself big despite its limited size. Strolling around Montevideo is a lesson in simplicity.

A city with the smallest and humblest president in the world, and the tallest palms. Amongst the sweet summer smell of banana trees and naftaline, Uruguay, the so-called "Switzerland of the Americas", still has something of the Maracaná about it, that thorn-in-the-side mentality.

Until the year 2002, there were no secondary education centre in the the Casavalle basin situated in the city's northern periphery. The Casavalle basin is a densely populated area with several neighbourhoods. Borro, Bonomi, Municipal and so on may be visible on Google Maps, but are absent from reality, harbouring a disheartening future for the families with scarce social and economic resources who live there.

Casavalle hangs the noose of poverty over its population. This is in part due to the absence of secondary schools capable of reverting the drop-out rates. The town of Casavalle's has a school-age population of over seven thousand, each representing a potential agent of growth and change, with no hope. Yet this is the birthplace of the dream called Liceo Jubilar.

Jubilar is a private high school, albeit a free one. Parents collaborate with what they can –without fees– and this means that they are doing it for the community's sake. They provide the committees of support, cleaning, and accompaniment during school trips, or during classes and continuing education workshops for adults.

The history of Liceo Jubilar is short, but intense. It is a young school21 that was born out of the abject poverty so characteristic of the precarious settlements and constructions of the district. Its transformation is a story of hope. You may ask anyone on these streets and surely they will respond: "It is not just any school, it's Jubilar". "Júbilo" means joy in Spanish, and joy is a good thing.

Before 2002, a dust-covered plain mostly occupied what today is home to a library, workshop rooms, computers, lunchrooms, sports fields, and hundreds of hopeful learning experiences. Based on intuition, goodwill, and hope, Jubilar developed an educational model based on distinctly Uruguayan elements of self-management, that innovative simplicity so characteristic of them, a simplicity renewed in each day.

They have created literacy centre for families, personalised monitoring plans for teenagers and adults, workshops for the effective involvement in school assignments, participatory dynamics in the school's organisation, personal agreements with each student for evaluations and term objectives, shared spaces for alumni, and the Belén Project for improving housing conditions in the area (along with other initiatives, big and small). Above all, it is a school21; when the student is absent, they go and look for him at home.

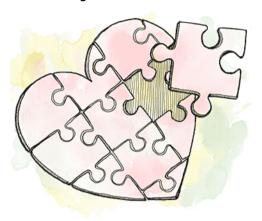# Schools21, schools for everyone

IDEA

Liceo Jubilar is a distinctly Uruguayan learning community built for an environment with many socio-economic needs.

It was born from the motivation and effort to radically transform its reality. Jubilar is about to reach maturity after an early and creative adolescence. It has set the foundations for change within the framework of learning communities, and it has done so by thinking about its students.

Schools21 are horizontal and democratic. Without the inclusion of all of the community's members there can be no innovation. None of the experiences that we have looked at on our journey generate a sense of internal or external exclusion, nor do they allow their students to fail. They reject all external criteria –social, curricular, or economic– that could represent an obstacle for their students' success.

Schools achieve their transformations into schools21 when the poorest of their students shows significant improvement, not only academic but personal, and vital. This is the true mark of success and innovation.

The complaint that we lack enough resources to improve our schools has turned into a recurrent excuse for exclusion. When we look at initiatives such as those of Liceo Jubilar, and of all other schools21, they show us that it is not so much about quantitative resources as it is about qualitative decisions that deliver the purpose and strategy of their

transformation. Our 4x4 innovation project will guide us until the end.

In 2010, the Centre for Applied Economic Research in Montevideo started a programme at Jubilar with the aim of evaluating its socio-economic impact.

The complete study can be consulted at : http://www.um.edu.uy/docs/working_paper_um_cee_2012_02.pdf. The study sets Jubilar as a reference for free education models with innovative methodologies and self-management practices. This translates into the repeated –although often shrugged off– Spanish mantra that stresses the value of having greater pedagogical and managerial autonomy to start processes of innovation with the capacity to be generalised within the entire system.

The data from Jubilar points to a 0% drop-out rate for the period 2005-2012, and to a significant decrease in repeated grades, from 16% to 0% in the period 2005-2009. Even more interesting is the fact, taken from compared data, Jubilar's budget is well within the amount regularly spent by the State on poor children attending other secondary schools.

METHOD

Finding your voice in the community

|| Telling the truth transforms the world"; said by Paulo Freire, who fulfilled the adage and transformed the world of thousands. Ramón Flecha, professor at the University of Barcelona, is a pioneer of learning communities in Spain. His model was inspired by the School Development Program from

> Every member of the community consolidates knowledge through egalitarian dialogue

Yale University, by the Accelerated Schools of Stanford University, and by the Success for All programme of John Hopkins University.

Learning communities are born out of the Paulo Freire's dialogical pedagogy. Vygotsky's socio-cultural theory put an emphasis on the shared construction of knowledge. The Brazilian educator saw egalitarian dialogue as a form of freedom, one where students, families and teachers are the protagonists in building community learning. Freire considered people as agents of transformation, and not of adaptation. We are not only seeking a place for our voice in the community, we want to transform the community, we want to become transformed by it. To learn is to build shared knowledge for collective growth.

Dialogical learning understands that reality and knowledge are built through the interaction among equals. It is why the members of the community appreciate learning through egalitarian dialogue, beginning the transformation of reality by listening and respecting the other points of view. The communications learning model of the University of Barcelona is based on three lines of action: literary gatherings, interactive groups, and family participation.

➲ The **literary debates** are sessions in which students, teachers and families read works of universal literature and discuss their concerns and reflections. These conversations revolve around topics of interest to the participants, who end up building vital knowledge together while speaking about friendship, characters, motivations, loyalty and other universal and human concerns.

➲ **Interactive groups** are a means of classroom organisation formed by heterogeneous groups. Each has different activities and the help of volunteers and teachers to make the learning process more dynamic.

➲ **Family participation** is sought in every area, be it as volunteers or as members of the literary debates. Learning communities open their doors so that everyone can participate. Like the Liceo Jubilar, they opt to get involved in collective activities in dining halls, playgrounds, and libraries through training workshops, support process, individual tutoring, etc.

The Mare de Déu de Montserrat school in Terrassa, Barcelona, is a learning community that went from 17% basic literacy to 85% in five years. Currently there are more than thirty educational centres in Spain implementing this model, which has crossed the border to take root in Brazil.

TOWARD A SCHOOL DEVELOPMENT PROGRAMME

The Comer model, implemented in more than a thousand schools around the world, provides an organisational, managerial, and communications framework for planning educational activities. When fully applied, the process yields a positive and stable environment for the school, as well as support for curricular activities and the school's renewed strength.

It is a collaborative system in which decisions are taken collectively, always looking for solutions, never pointing fingers.

PARENT TEAM
- Involves parents at every level of school activity

SCHOOL PLANNING AND MANAGEMENT TEAM
- Plans and coordinates school activities

STUDENT AND STAFF SUPPORT TEAM
- Prevention
- Directed towards the school's students, as a whole

COMPREHENSIVE SCHOOL PLAN
Directed mainly towards:
- Academic goals
- Social goals
- Public relations goals

ASSESSMENT AND MODIFICATION
- Periodic assessment delivers new information, and identifies new problems that may arise in the programme

STAFF DEVELOPMENT
- Developed in accordance with the needs identified in the Comprehensive School Plan

CHILD/ADOLESCENT GROWTH

HUMAN RELATIONS

SOURCE: Yale Child Study Center. SDP. School Development Program. http://medicine.yale.edu/childstudy/comer/

What can I do at my own school?

ACTION
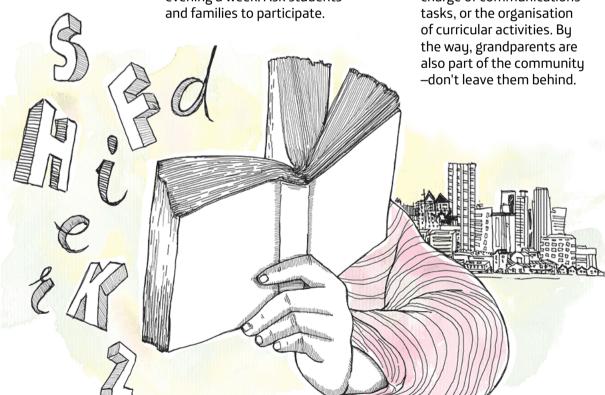
1 Create dialogue circles. Learn from the success of these literary gatherings and reproduce the model at your school. Let students, teachers and families participate in dialogues on the classics of literature. But don't let expert roles take over; favour equal treatment for everyone and let conversations follow a spontaneous rhythm. *Hamlet*, *The Picture of Dorian Grey*, *Moby Dick*, *Twenty Love Poems and a Song of Despair*, *The Old Man and the Sea*, *Lazarillo de Tormes*... literature is life. In addition to the gatherings, you can find spaces for discussing school organisation, one evening a week. Ask students and families to participate.

2 The PTA is dead. Bring parents into class, to projects, to the library... to any activity where they can play a role. Don't let the association model obstruct family participation and become an obstacle for building the community. Create workshops and cultural experiences that foster family participation... or even better, encourage family participation by creating workshops on topics of their choice. Opt for literature, music, film and social skills, for example. You can also offer courses related to their professions or hobbies, or ask them to take charge of communications tasks, or the organisation of curricular activities. By the way, grandparents are also part of the community —don't leave them behind.

"

Organise extracurricular activities related to subject areas

3 Call for elections. Highlight the symbolic and participative value of having delegates from each class involved in the school's management. Have elections and encourage students to present their proposals. Explain the democratic model of our societies using your own school as example. Let families and teachers vote.

4 Dust off your own educational project. A school project only makes sense if it belongs to everyone. Don't lock it up in the headteacher's office. Take it out for the world to see, redesign it through participative dynamics and let families study it in detail. Use cultural weeks, special events or founder's day to give parents a space where they can help draft the project. But not sitting down, get them to stand up, in circles with post-its, sharing ideas and reams of paper, enjoying the process.

5 Everyone standing up. Shy away from informative meetings where parents spend the whole time listening. There is a new rule in the community: for each course or grade meeting, the tutor can guide the session for only one third of the time. The other two-thirds have to be dedicated to activities in which parents participate, following the same methodology that you use with students in your class. By letting families participate through sequences of activities, palettes and matrices, we discover more about our pedagogical proposal

and about the development processes of their children. Why not have a design thinking session with families?

6 Get out and enjoy your surroundings. In order to transform your school into an educational community, you need to learn about and related to the cultural and social mediums of our immediate reality. The school can benefit from the environment and the community by creating volunteering programmes, by inviting other professionals to participate, and by devising projects and didactic units that reflect on specific actions with impact on the immediate reality.

7 The school is the voice of the students and what they say about it. Open the doors of your school and let students organise the visit, or the centre's communications plan on social networks. Specific and real participative action is all you need to build more affective and effective relationships in the community.

8 Extracurricular is also curricular. Organise extracurricular activities around the subject areas, and take advantage of these moments to make classwork livelier and more realistic. In this way, the school becomes a reference for learning, offering educational possibilities that extend beyond the official schedule. Expand your school and discover potential new learning spaces in the community.

BIBLIOGRAPHY

- **CREA** (2006-2011) *Strategies for Inclusion and Social Cohesion from Education in Europe. Sixth Framework Programme. Priority 7: Citizens and Governance in a Knowledge-Based Society.* European Commission.

- **Valerie HANNON**, **Alec PATTON** and **Julie TEMPERLEY**: *Developing an Innovation Ecosystem for Education.* Cisco, 2011.

- **KEDI**: Korean Educational Development Institute. 2011.

- **Charles LEADBEATER**: *What's Next? 21 Ideas for 21 Century Learning.* The Innovation Unit, 2008.

- **OECD**: *Innovation to Learn, Learning to Innovate. Centre for Educational Research and Innovation.* OECD Publishing, 2008.

- **James TOOLEY**: *The Beautiful Tree. A Personal Journey into How the World's Poorest People are Educating Themselves.* Cato Institute, Washington, 2009.

TO LEARN MORE

Learning communities

www.utopiadream.info

The research and development framework programme of the European Union has been successfully carrying out projects for the development of learning communities in school throughout the continent. Thanks to community participation and pedagogy that inspires dialogical learning, the learning communities model is making meaningful strides in the reduction of academic failure in all types of European schools.

Omega Schools, Ghana
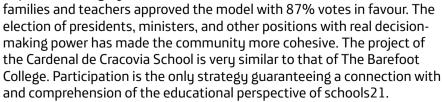
www.omega-schools.com

At Omega Schools, students pay for what they learn. It's that simple. But payment doesn't have to be in currency. In fact, it never is. Teachers schedule tasks that forge a connection between students and school life. Students then monetise their participation in these cultural and participative tasks, which go from reading to volunteering in literacy programmes for the elderly. The latest grand achievement is the design of the digital infrastructure. They have managed to personalise learning through an individualised plan for each student, thanks to giving a tablet to their teachers. Based on the blended learning model, they use digital resources to monitor students, and to adapt to their progress.

Cardenal de Cracovia School, Santiago de Chile.

www.mundokarol.cl

The model of the Cardenal de Cracovia School is so participative, communitarian and democratic that it has its very own constitution, departments, and delegates. After seven years of success it decided to call itself "The Educational Republic". Voting by students,
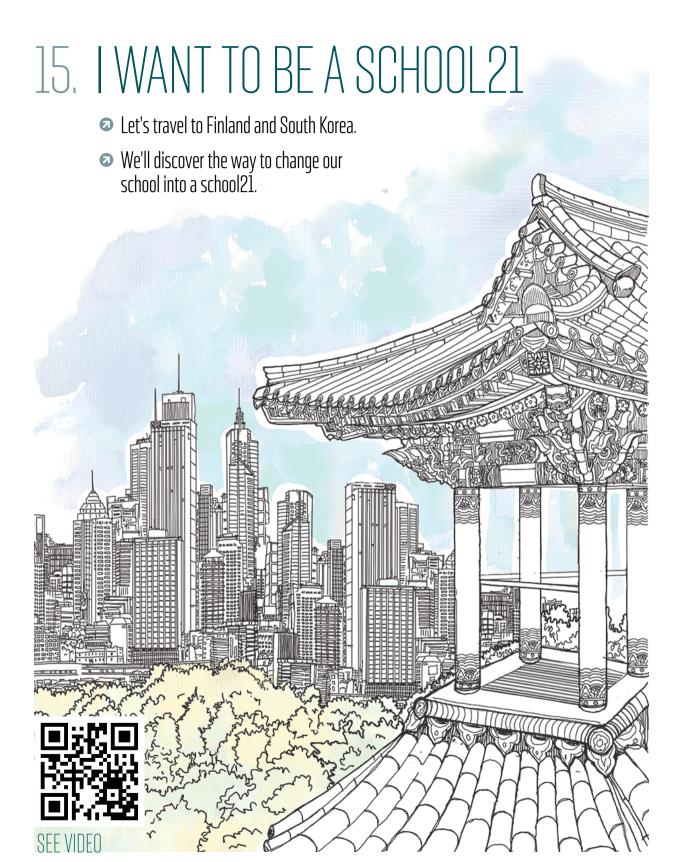

families and teachers approved the model with 87% votes in favour. The election of presidents, ministers, and other positions with real decision-making power has made the community more cohesive. The project of the Cardenal de Cracovia School is very similar to that of The Barefoot College. Participation is the only strategy guaranteeing a connection with and comprehension of the educational perspective of schools21.

15. I WANT TO BE A SCHOOL21

⬈ Let's travel to Finland and South Korea.

⬈ We'll discover the way to change our school into a school21.

SEE VIDEO

South Finland

JOURNEY

South Finland is not a country. However, can you guess what the objectives are of the most innovative programmes, and the ones with the best results, that are being developed in both Finland and South Korea? Both countries have had the best rankings in the PISA evaluations over the last few years, and once again, they are leading their schools towards a common goal.

KEDI (the Korean Educational Development Institute) is located in South Korea, the country with the world's best academic results. KEDI headquarter is the epicentre for international educational innovation. Coherent with its Asian heritage, it makes its progress silently, albeit with a clear perspective for the transformation of schools across the country.

Since 2013, KEDI's objectives have pointed in two different directions. On the one hand, they seek to implement personalised learning programmes through technological integration. KEDI has long been developing a digital model based on its own content creation that allows professors to develop blended learning strategies alongside their projects. Their initiatives seek to give students more autonomy and to expand their learning potential at the same time. The model is similar to the one we looked at with Kunskapsskolan and the other school21 experiences using the four-floor digital design.

On the other hand, KEDI aims to create learning communities where students are the protagonists. They started by creating projects that were founded in the needs of the community. They merged challenges related to public transport, to school bus or the library, and the project-based learning model and blended learning dynamics. In this way, they developed concrete solutions, and presented them to the local authorities. Currently they are trying to improve the model by integrating more individual and teamwork time for the students, who are given more autonomy to choose their schedules and spaces. They have also developed a catalogue of cultural and participatory activities within the curriculum. The objective is to make KEDI a social and cultural point of reference for families. KEDI seeks to design the best schools in the world based on personalised learning that integrates PBL and technology, seeking out greater ties for the school within the community.

In Finland, everyone is talking about Innoomnia. Since its inception in 2011, it has become the new buzzword. Innoomnia is a school21 in the city of Espoo, north-west of Helsinki. Its educational project is based on strategy-based projects and on blended learning, thanks to its digital infrastructure. The participation of career professionals and their connection with creative projects and strategies based on design thinking are part of their day to day. They have signed agreements with companies

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> Innoomnia and KEDI mark the end of our journey. They represent the road that we have narrated from chapter to chapter
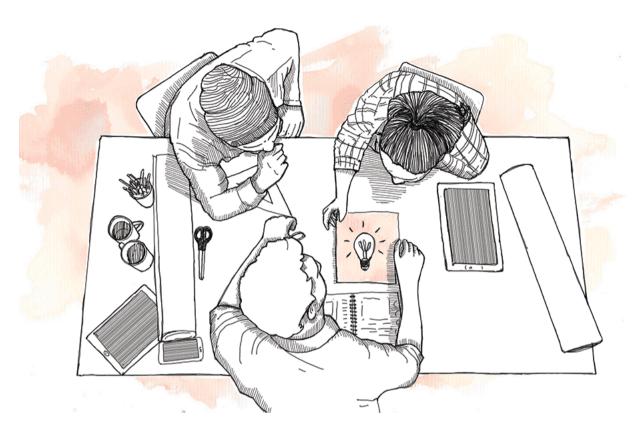
to convert students into interns and real entrepreneurs, rather than mere pupils. They have also created various missions, following the Quest to Learn model from New York, in developing game-based learning. Schools21 around the world grow together.

As for the design, it has opted for completely open spaces and modular scheduling (similar to the one at the Ørestad Gymnasium). However, during most of the day students choose what area they wish to work in and how, in accordance with the personalised plans they have developed with the aid of their teachers. These plans are presented to the community.

Each student makes frequent public presentations and looks for projects that are relevant to the local environment, although having global impact. Voting mechanisms allow students to partake in organisational decisions and school management. There are also many students running extracurricular workshops where students from other schools participate. Student life revolves around the Innoomnia community.

Innoomnia is not a common place. They like to define themselves as a centre for entrepreneurship, a hub of sorts. One that they can't easily name, since it doesn't quite feel like a school. School21 certainly suits it well.

Innoomnia and KEDI mark the end of our journey. They represent the road that we have narrated from chapter to chapter in describing how to become specialised learning communities.

IDEA

What defines schools21 ?

The world is full of schools21. What great news! We started our journey with María in Bogotá and with a stopover in Bangladesh on the road to India and finally New York. Helped by tigers, pirates and superheroes, we revealed the mechanisms that make schools grow. The four sources of the curriculum provide the scientific bases and mark out the 21ST century skills. On the other hand, the four cornerstones of the school help materialise the forms and the places for change to begin this transformation. The 4x4 model guides innovation and transformation in schools21.

A school21 acts, changes, and develops with an eye to the present, to research and to global and local realities; in order for each student learn how to live, to tell his/her story, to discover and transform the 21ST century. Through this institutional development, schools discover their identity and evolve towards personalised learning communities that guarantee the success of all of their students.

All the schools21 that we have looked at have been transformed by a comprehensive innovation project based on research and manifests itself in small daily acts in accordance to the four cornerstones of change. The first step in all innovation is taken by one person, somebody who acts and communicates with another; then, a group; then, a school; then, a movement; then, a collective; then, a social initiative... and maybe a few steps further down the line, a law.

> We find ourselves at the re-birth of the epitome of the educational institution: the school

Schools21 are changing the world and they are doing so by learning from the best experiences and by taking concrete actions. It is about daily activities in the community where parents, teachers and students are the main characters.

During our stop in Sydney we started with a description of the new learning scenario. We discovered the initial characteristics of a transformation project built upon the multiple intelligence framework. Chapter by chapter, we nourished our project. Now we are ready to complete it.

What happens at High Tech High is similar to what happens at Escolas Lumiar, at Discover1, at the Montserrat School, at Quest to Learn, at Ørestad Gymnasium, at Kunskapsskolan, in Innoomnia, in Sydney, New York, San Francisco, Manchester, Sao Paolo, Copenhagen, Buenos Aires… These schools are making a new institutional model. Different projects around the world are going through similar transformations and achieving better results.

We find ourselves at the re-birth of the epitome of the educational institution: the school. Travelling from school21 to school21 has allowed us to recognise this new shared identity. An identity that manifests itself in the four cornerstones: the design, the methodology, and evaluation of curricula; the roles played by students and teachers; planning and scheduling; and the use of space.

Curriculum design, methodology and evaluation

➲ Learning is boosted through designing experiences.

➲ They foster active student participation and turn the classroom into a personalised and diverse learning scenario.

➲ They seek out student autonomy and explicitly integrate key 21ST century skills in their programmes.

➲ They relate contents to everyday life in practical way, finding both local and global connections.

➲ Cooperative work is an essential part of many subject areas and projects, and it is found at all ages. It structures social harmony at the school and it is a key axis of creativity within the community.

➲ They integrate well-defined cognitive strategies, encouraging students to think about their own thinking processes. This will create a more aware and proficient learning culture.

➲ They integrate conflict in its diverse forms: surprise, enigma, dialogue or challenge. This invigorates the active construction of understanding and motivation.

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Project-based learning has driven the coherent integration of all these elements

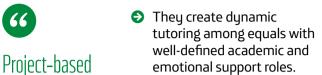→ They create dynamic tutoring among equals with well-defined academic and emotional support roles.

→ They are constantly evaluating, and with varied tools. Evaluation is a central activity in the design of learning experiences.

→ Project-based learning is the methodology that has driven the coherent integration of all these elements.

→ Evaluation is authentic and it relates to real-life through presentations, products, portfolios, prototypes, companies, art, tests, drafts, dossiers, curricula, websites, reports, interviews...

→ Students integrate technological devices into the learning scenario. These devices facilitate learning by encouraging autonomy and continuous evaluation.

→ These tools are used on all four floors of the digital building, and assist the development of blended and personalised learning programmes.

→ They create commitments and individualised learning plans with students.

→ They have an institutional communications strategy, sharing their own contents, resources and videos on the web.

→ They have an explicit intra-personal and inter-personal programme for emotional and social development. They truly believe that empathy, respect, assertiveness, creativity, and self-control... are learned skills.

Student and teacher roles

→ Students and teachers share a vision of comprehensive education and key skills needed for the 21ST century. This is evident in their programmes, their signs, their spaces, their conversations with families, their education plan, their corridors...

→ Teachers are designers of learning experiences in which they themselves participate, learn and enjoy.

→ The design of experiences and projects is an activity shared among the members of the teaching staff. Teachers find professional growth through shared evaluation and the way in which they reflect upon the action.

→ It is understood that teachers need to keep learning in order to improve the ways they work within the transformation project. This is why they dedicate time and spaces for their own learning.

→ Students learn more through cooperative roles in groups and

tutored activities. Students gain spaces, functions and time to become educators.

→ Teachers are specialists in their areas, but they also carry out roles as tutors, experts, personal guides, mentors and coaches.

→ Students are the main characters in the development of experiences. The teacher balances their advisement, tutoring and monitoring of each student and their projects with the transmission of information to guarantee active student involvement.

→ Students provide evidence of their learning through portfolios, research diaries and other tools for documenting learning.

→ Badges and symbolic copyright models have been created so that students may take more responsibility for their work, their learning and the products that they develop, by linking them to the real world through possible applications.

→ Students and teachers evaluate each other, as peers.

→ Authentic evaluation is subject to negotiations with students. The purpose is to make them more autonomous, aware and responsible for their own learning.

→ Parents, teachers and students understand what the key skills are for the 21ST century and they know that leadership, creativity, and teamwork are all human capabilities that can be taught successfully.

→ Parents, students and teachers play a democratic and egalitarian role in the school's decisions and organisation.

→ Elections of representatives are highly valued and a culture of dialogue is encouraged through extracurricular activities that relate class work to cultural topics.

→ Families participate in workshops, or directly in class projects.

> " Teachers need to keep learning in order to further improve their pedagogical skills

Planning

→ They organise the school calendar and schedules in accordance with the design of learning experiences, and not solely based on the division of subject areas.

→ They opt for simple schedules with the aim of maximising learning.

→ Time is mostly distributed in micro-modules that last an average of 80 minutes.

→ They offer modules without a teaching load so that students may decide and take responsibility for their own learning and time management.

> **"**

Families create or participate in workshops, or directly in class projects

- Learning is based on projects, matrices or varied mosaics of learning experiences. These are the keys to the modular design, perfectly integrated with the development of curricular subjects.

- Projects ensure personalised and deeper learning that is well integrated to the community, thanks to the simplification of schedules.

- There is time for individual and group learning through cooperative groups and personalised teacher and peer tutoring. These criteria are also important for organising the schedule.

- Within the schedule there is space for students to choose the way in which they want to learn.

- The schedule is organised in accordance to methodological criteria and isn't solely based on the development of each subject.

- Conferences, workshops and other forms of open participation where the whole community partakes are encouraged.

- The school's organisation involves democratic and participative frameworks for parents and students. The election of representatives is highly valued.

- The design of projects and learning experiences is usually related to results and the impact that they have on school organisation.

- Time is allotted daily for this purpose: early in the morning, during lunch or in the evening, so that teachers may work together and coordinate their planning along with other educational activities.

- Participation of family members and experts in project development of the school is encouraged.

- Meetings with parents and teachers are of a participatory nature and they involve the same tools and designs that are implemented with students.

- Participation, communication and school management has significantly improved thanks to the integration of technology.

- Social media, blogs and the school's website communicate the students' learning experiences and their projects.

- They connect, they travel and they learn from the success stories of other schools.

- Technology has allowed the community to extend 24 hours a day, seven days a week.

- Extracurricular learning activities are integrated as part of the students' learning process and directly relate to projects, class experiences and curriculum.

Use of space

> **"**
>
> Participation, communication and school management have significantly improved thanks to the integration of technology

- The organisation of space both within and outside the classrooms encourages cooperative work and the collaboration between students and teachers.

- The staffroom itself is a "collaboration centre" for designing experiences and projects.

- All the spaces in the school are defined by their functionality and are respectively dedicated to multiple intelligences, cognitive strategies, projects, reflection, teamwork, thinking, conflict resolution, and time to be on your own alone... every corner has a particular educational function.

- Proofs of learning are displayed in corridors, rooms, entrances, on screens, exhibitions... frequently celebrating the institution's achievements.

- They all have at least one super-classroom.

- The use of the space is interpreted according to the function and usages: corridors and any other spaces are conceived as additional learning environments.

- Because the space itself educates, its design is an integral part of the projects and activities that are carried out by students, teachers and parents.

- They diversify and enhance learning spaces through activities in their community, outdoors, in school gardens, in sports facilities, at day centres...

- Functional use comes about by re-designing spaces in accordance to reality, to challenges and to the needs of the 21ST century. Spaces are conceived as "wikitechs", museums, start-ups, "collaboratories", workshops, observatories...

- Educational potential is bestowed upon these useful spaces thanks to camp-fires, water fountains and caves.

- They have raised a digital building, forging their identities and fully coordinating with the design of their learning experiences, as well as student and teacher roles.

- The digital space gives priority to student autonomy and active participation. It is used in accordance with the methodological criteria that guide the design of educational experiences.

Schools21 never stop growing and developing. With the sources of the curriculum in mind, they take specific steps on the continuous spiral of growth that translates into these four cornerstones for change.

METHOD

A shared road for innovation

We need to turn our schools into world innovation centres. A school should be, above all, a place for personalised and community learning. Where there is learning and growth, there are schools21.

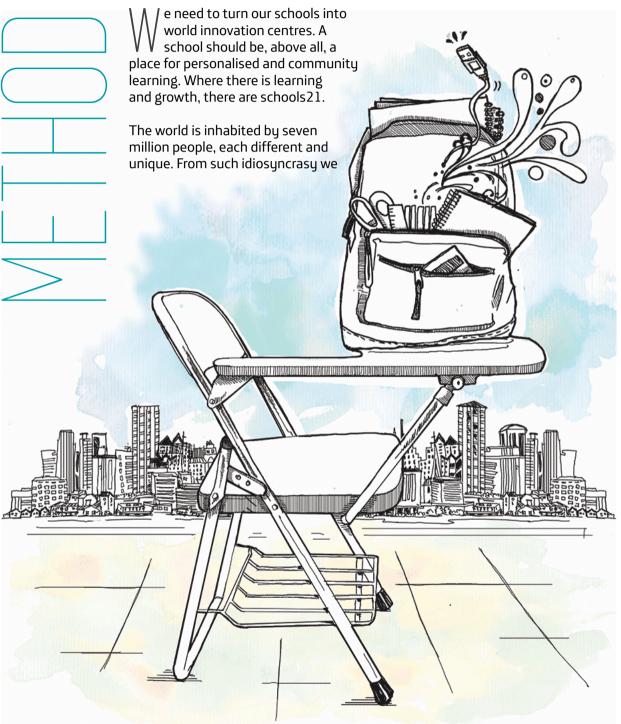The world is inhabited by seven million people, each different and unique. From such idiosyncrasy we

> All the schools that we have discovered have developed according to a shared model, embracing their identity as a school21

evolve and grow along a common path. We are humanity. The same applies to schools; no two are alike. Nevertheless, all the schools that we have discovered have developed according to a shared model, embracing their identity as a school21.

Some years ago, these schools were radically different. Their openness to research has allowed them to implement practical applications and guide them on the road towards this transformation. From the theory of multiple intelligences to project-based learning, we have been examining the new identity of the classroom as a learning scenario. We have dissected thinking, deepened our understanding of cooperative learning, and projected our dreams into real projects. We are guided by a journey shared around the world. This journey has allowed us to distil the road to innovation shared by schools21.

Each new phase lays the foundation for the next. It is very hard to learn by means of projects if we are not used to working in teams. Teamwork and roles are crucial elements for project planning. At the same time, cooperative learning is sustained within a culture of thinking shared by students and professors alike.

Similarly, the enrichment of methodologies and tools has allowed us to create coherent didactic sequences that are differentiated and varied in such projects. It is quite difficult to launch yourself into PBL without having had previous experience managing palettes or matrices, or without having previously integrated cognitive strategies, roles and other key cooperation techniques. The design of the digital structure and its integration in projects extends potential spaces for learning, giving students freedom and autonomy in terms of time and space. The digital school conquers corridors, cities, homes and the Internet in the name of learning.

⊙ **Methodological enrichment.** The theory of multiple intelligences is based on personalised learning. To begin with, differentiation enriches our methodology. We all learn in different ways and our intelligence has multiple faculties for understanding and creating. Enriching learning with activities based on multiple intelligences gives more opportunities to our students. As teachers, we are designers of learning experiences. Start with a good palette and build on the creation of spaces and intelligent content for your school.

⊙ **Culture of thinking.** Educational discourse based on questions and the creation of conflict are the first steps in conquering curiosity in the classroom. Visual representation of strategies, the creation of knowledge and mental maps, along with provocative and egalitarian dialogue guide the construction of knowledge. Together they activate memory and put it at the service of intelligence. The multiple intelligence matrix, Bloom's taxonomy and the integration of cognitive strategies with curricular content set the foundations for cooperation in the classroom.

> "
>
> Creativity can be learned; you just have to introduce strategies that stimulate student potential

Cooperative learning. You learn more and better when working with peers. Students improve their results by taking up the work of educators. Positive interdependence, the arrangement of tables and groups, and the creation of defined roles with distinct skills are just some of the components that lead to successful cooperation. Cooperation improves motivation, brings emotions to bear on assignments, and cohabitation, and prepares us to make the leap towards the catalyst in our school's transformation: PBL.

Project-based learning. Designing projects allows us to create personalised challenges and products, as well as to work in teams and to integrate thinking strategies with curricular content. PBL phases make the learning relevant to the real world. Students and teachers share autonomy throughout the process. This allows us to create modular structures that simplify scheduling and maximise potential time for learning. With PBL we enrich and adjust our evaluation methods.

Authentic evaluation. All the changes in our projects and methodologies start at the centre of evaluation. To talk about evaluation is to talk about students, because authentic evaluation is a portrait of that learner. Evaluation is the trigger

for planning and allows for the aptest personalisation of the learning process. At schools21 we have learned to evaluate by sharing the criteria with students, by encouraging commitments and personalised learning plans, by going beyond testing as the only viable form of assessment, and by being attentive to processes and products found in the entire scenario. Every evaluation experience is, in reality, a learning experience.

Design thinking. Creativity can be learned; you just have to introduce strategies that stimulate student potential. PBL sets the foundations for a livelier and more realistic form of learning, which is enhanced with the incorporation of design thinking. More and more we are relating our educational practices with the local environment and making transformations that have real impact. Curricular contents also concern the community.

The digital school and the conquest of space. Designing the four levels of a school's digital infrastructure allows us to expand education and create new potential learning spaces. Schools21 also communicate and engage in community building from their websites. We have discovered how to

THE CORNERSTONES OF LEARNING IN SCHOOLS21

1 Methodological enrichment
We all learn in different ways

This learning offers more opportunities to all the students

2 Culture of thinking

Education based on questions generates curiosity

3 Cooperative learning
We learn more and better among our classmates

The students improve their results by playing the role

4 Project-based learning
The learning becomes real and is related to the world

Simplify the timetable to maximize learning
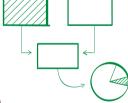
5 Authentic evaluation

The evaluation is the trigger for the programming and allows maximum personalization of the learning

6 Design thinking
Creativity is stimulated differently in each student

7 Conquest of space

Creation of new potential learning spaces

8 Learning communities

Creation of community in the dialogue with families and students in the school management and organisation

make our projects more didactic through game-based learning and we have created personalised group environments for virtual learning. A school defines its spaces by their function and the digital infrastructure has freed us from the static chains imposed by rooms and materials. Students gain autonomy through digital integration, conquering workshops, water fountains, caves, "wikitechs", displays... Digital and physical infrastructures also educate.

➲ **Learning communities.** Personalised learning builds communities through egalitarian dialogue, democratic elections, and the participation of families and students in the school's management and organisation. PBL and design thinking have laid the foundations for the creation of learning commitments with the students, but also for opening up the school to families and experts. Schools21 are re-invented with each student in the design of learning experiences and the direct involvement of students and families in the school's management. Only participation can ensure the active involvement in and understanding of the education project. Open your school to the community.

A concrete transformation plan

ACTION

1 Present the schools21: communicate, get involved. Recruit a group of professors and assign them new roles: catalysts for innovation, generators of change, delegates of success, etc. Show the experiences of schools21 to your teaching staff and your community. Take advantage of training sessions and parents' meetings. Explain why and how these school achieved their success.

Imagine with your colleagues what your school will look like in ten years. Dream about the improvement. Draft your dream of transformation.

Recover the core values of your educational project and put them to work for your dream. How can they be expressed? How can they be materialised? How to make them come alive today?

2 From dream to reality: creating the model. Based on this visualisation, prompt teachers to take specific actions. Learn and enjoy yourself through design thinking. Create a pledge sheet to commit teachers to the school's improvement. Together, sign the manifesto. Inform students and parents about the commitment. Remember that you are looking out for the best in each and everyone of them. They will be on your side.

Learn more about those schools21 you are more interested in and plan an educational visit.

Connect with the community by visualising a shared dream, but establish real goals for the year and term.

Seek support from government and local institutions.

3 Develop your proposal: awaken your school21. Approve changes and allocate work spaces to those teachers who will act as catalysts. Choose one of the scenarios that we described in the previous chapter to carry the plan forward. The most often chosen path among schools just starting out is as follows:
- Scenario 1: A special week.
- Scenario 2: Project day.
- Scenario 3: A part of the curriculum.

> **Consolidate each step, stay in each phase as long as necessary, but never take a step back**
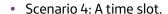
- Scenario 4: A time slot.
- Scenario 5: Spaces for free choice.
- Scenario 6: The whole year and the whole curriculum.

Look for weekly spaces to begin trial activities with the teaching staff, following the order of significant contents that we have discovered on our journey.
- Methodological enrichment. Create a palette.
- Culture of thinking. Schedule.
- Cooperative learning.
- Project-based learning.
- Authentic evaluation.
- Design thinking.

Work transversally and initiate specific changes:
- Re-design common spaces and flood the hallways with metaphors.
- Build water fountains and caves, at least in the hallways, and expand the classroom.
- Focus on the second and fourth floors of your digital building.
- Document the whole process, create samples of the pedagogical contents and publish your progress on the web.
- Start the process of involving families, letting them visit the classroom, participate in debates, or build their own after-school workshops.

4 Reflective-action: teachers in "collaboratories". Once you have chosen the model and the contents, bring teachers of the same subject area and year into the classroom. Share material and observe your peer's work.

For each new activity, revise the process in pairs, or in cooperative roles, and give special attention to documentation. Be strong in your argumentation, and kind to people. Celebrate achievements, show them to the community and look for possible improvements.

Every term or semester at the most, move towards new contents and scenarios. In two or three years, the school will be experiencing concrete and meaningful improvements.

5 Keep growing: don't slow down the tempo. Keep evolving within the content scenarios. Consolidate each step, stay in each phase as long as necessary, but never take a step back. Give new identities to the school's spaces. Create a "wikitech", a convention centre, workshops, and of course, an amphitheatre.

Design and create a super-classroom. This is an essential space. Discover your super-classroom and conquer spatial autonomy.

Create dialogue circles where families and students can discuss issues regarding the school's organisation.

Call for school elections, opt for a democratic voting model.

Invest time in visits to schools21, or contact their teachers. Seek support from their work, videos or publications.

BIBLIOGRAPHY

- **John ABBOTT, Heather MAC TAGGART**: *Overschooled but Undereducated. How the Crisis in Education Is Jeopardizing our Adolescents.* Continuum, London New York, 2011.

- **Guy CLAXTON**: *What's the Point of School? Rediscovering the Heart of Education.* Oneworld, 2010.

- **Ivan ILLICH**: *Deschooling Society* Virus, Madrid, 1985.

- **Insight Labs**: *Disrupting the Discourse; an Insight Labs Inquiry into the Rhetoric of School Reform.*

- **Charles LEADBEATER, Annika WONG**: *Learning from the Extremes.* Cisco, 2010.

- **Mona MOURSHED, Diana FARRELL and Dominic BARTON**: *Education to Employment. Designing a System that Works.* McKinsey Center for Government.

TO LEARN MORE

KEDI in South Korea

http://eng.kedi.re.kr/khome/eng/webhome/Home.do

This centre for innovation and learning in Seoul is changing the schedules of schools throughout the city, making them more personalised and allowing students to choose their own itineraries. This is being achieved through the establishment of a national digital curriculum.

Innoomnia, Espoo, Finland

www.innoomnia.fi

Innoomnia is a school21 in the city of Espoo, north-west of Helsinki. Its educational project is based on strategy-based projects and on blended learning, thanks to its digital infrastructure. The participation of career professionals and their connection with creative projects and strategies based on design thinking form part their day to day. They have signed agreements with companies to convert students into interns and real entrepreneurs, rather than mere pupils. Each student makes frequent public presentations and looks for projects that are relevant to the local environment, although having global impact. Voting mechanisms allow students to partake in organisational decisions and school management.

Think Global and Avenues School, around the world

www.thinkglobalschool.org / www.avenues.org

The initiative of Think Global School and Avenues Schools have taken a great leap forward and created a global community. During their four years of secondary education, students study in different countries. The perspective may be international, but the reality is based in the community. Students participate actively in local workshops in

their countries, have student elections, form groups with families and neighbours, and use a digital portal dedicated to, above all, creating a worldwide learning community, which is their flagship.

ENDING WITH THE BEGINING

Sunset in the mangrove. A family of tigers yawn with the final rays of sunlight. A few metres away, Abul Hasanat docks his barge, but nobody gets on or off. The children do not want to leave their teacher. They are happy on the only school-boat in the world. The Bay of Bengal is merciless in its flooding, but this school21 keeps all its students afloat.

In India, Bunker Roy begins the night shift with teenagers who work during the day. Today is a special night for the Barefoot; they are celebrating democratic elections. They will choose the president and the ministers.
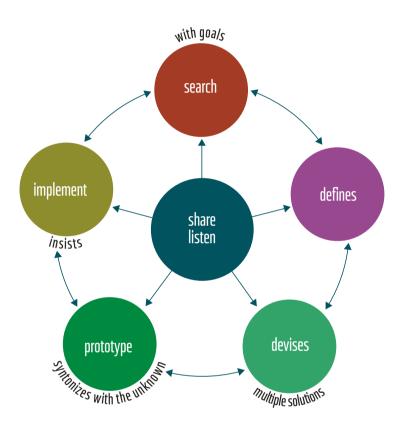
The superhero supply store in Brooklyn has not lowered the blinds quite yet. You never know when Aquaman will need a new pair of trousers. So the volunteers keep it open as long as possible. A mentor and an apprentice finish signing a new commitment to continue with their obligations. Now they can quietly rest.

AN ITERATIVE PROCESS

Iterative design is a methodology based on a cyclical process to prototype, test, analyse and refine a product or process. Changes and improvements are based on the test results of the most recent design iteration.

The aim of this process is to improve the quality and operation of a design. In iterative design, depending on the design versions that are implemented, the interaction with the designed system is used as a way of researching the project.

In Barcelona, the funicular of Vallvidrera has turned in for the night, but the lights are still lit in the Montserrat School's "Leader Lab". Various students have taken the stage in the amphitheatre. They are presenting the end of a project in the coming twilight. Two lecturers synthesise ideas on the latest assignment in design thinking. In another corner, a group of students take photos of mind maps written on the glass walls.

On the other side of the world, in Sydney, The Zone is a nearly empty superclass. Only a few students still haven't left. The teachers have to throw them out somehow. There's just no getting them to leave! "Just one more minute…", they beg, "we're so close to getting a new matrix badge".

After a long day of work, the team of teachers at the KIPP centres reflects on the map of thinking routines for this course. They are going to introduce a new plan of blended learning and want to renew their strategies and integrate them with digital tools.

Jimena returns home through the coffee plants and banana trees of the Quindío rainforest. Today it was her turn to be "leader" in her group and she felt better than ever. Mateo swore that, next week, he'd try to do it as well as she had.

The schools of the Alianza Educativa in Colombia and the High Tech High in San Diego are overflowing with projects. Michael and Paola go home happily because so many of their peers have sent them new videos explaining where

ENDING WITH THE BEGINNING

> **And you, what can you do to become a school21?**

all the food at home has come from. They already have a lot of material for the documentary and today, before bedtime, they will reflect on their satisfaction with the digital portfolio of their project.

Meanwhile, in Ahmedabad, the Riverside centre continues to receive creative projects from all around the world. In his latest letter, the sender writes from a digital tree; it is the Ceibos building in the Technical Laboratory of Uruguay. They talk about the Ceibal Plan.

In the end, Sabina took time out for one last dip in the pool. She has broken her own record. She is very happy with the new strategies that her tutor recommended in the plan for this week. Her father returns by train from Stockholm, but she has already told him everything on the Kunskapsskolan platform. Now she is writing to Jonathan. She's going to advise him to choose Mr Smiley's Xpod. She would love to create her own restaurant. Maybe they will Skype tomorrow. Quest to Learn really piqued her curiosity.

Ulises just told his parents how light behaves in fish tanks filled with water, in empty ones and in tinted ones. He loved Aletheia's display this year. He can't wait for tomorrow so that he can return to the studio. The family is celebrating it at home with an Argentine barbecue, as they should.

In Copenhagen, Morten watches students making the most of the final minutes in the caves and troughs of Ørestad Gymnasium. The spectacular staircase is emptying step by step.

El Jubilar in Montevideo begins with afternoon workshops and many families are attending so as to learn to read and write. Smiling students and parents go in and out of their houses, the congregation blowing them kisses as they leave.

Meanwhile, it is the dark of night in the European latitudes and in Helsinki airport, a team of teachers from Innoomia are taking an aeroplane destined for Seoul. They are intending to visit KEDI.

Night falls around the world, tomorrow will be another day. Now is the time for the dawn of life.

And you, what can you do to become a school21?

SCHOOL DIRECTORY

www.fundaciontelefonica.com