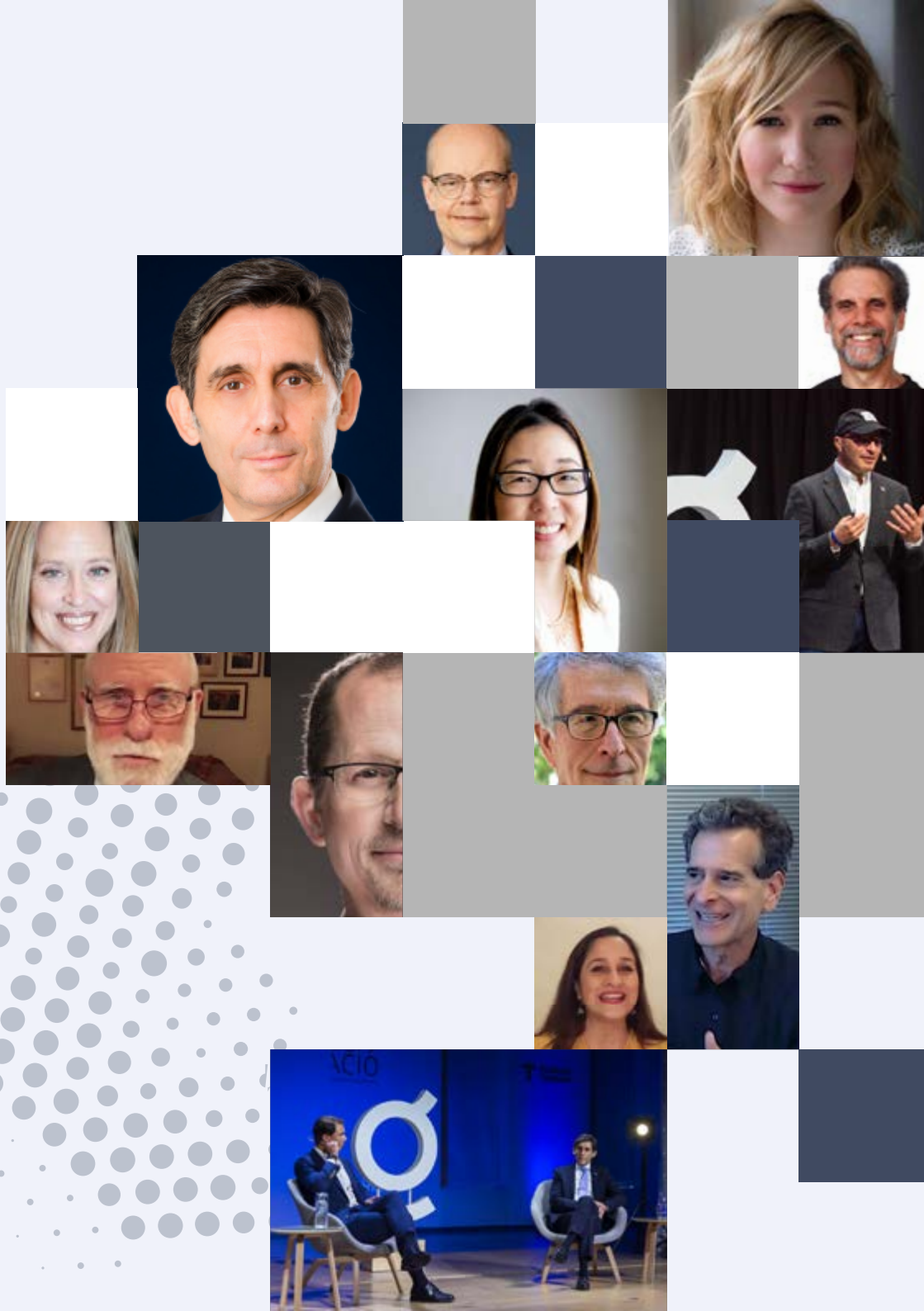
KEYS TO NARROWING EDUCATION GAPS



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REINVENTING EDUCATION IN A DIGITAL WORLD

Fundación Telefónica

ie UNIVERSITY

SOUTH SUMMIT
INNOVATION IS BUSINESS

PRESENTATION

CARMEN MORENÉS

Director General
of Fundación Telefónica

While it is still too early to predict the effects that the COVID-19 pandemic will have on education globally, two immediate consequences became apparent very early on: a positive one, the increased social awareness of the importance of education, especially among children and young people; and a negative one, the risk that the gaps that already exist are aggravated by this global crisis. Education has always been a powerful leveller of social inequalities, but in the age of the digital revolution it is more so than ever: one certainty overrides all the doubts about the future.

MARÍA BENJUMEA

CEO of South Summit

If humanity has been able to cope with the greatest global upheaval for decades, it has been thanks to the spirit of innovation: to the achievements of science spanning centuries, and to the extraordinary breakthrough in biomedical research in just a few months. The pandemic has served as a reminder that innovation is the main ingredient in any formula for societal progress. It is essential to teach the new generations about the culture of innovation, and to instil this transformative drive into the educational process. It is undoubtedly one of the best investments we can make for a better world.

DIEGO DEL ALCÁZAR

CEO of IE University

Preparing people so that they are able to build their own life plans, and training citizens who are useful to society, have been and continue to be the purpose of any educational project. In an age dominated by a succession of disruptive changes, these objectives become more difficult, but all the more necessary. Therefore, adapting training to the demands of the labour market, aligning the competences and skills that students acquire to the needs of the new society, and extending the updating of knowledge over a lifetime, are the main challenges that those of us who are dedicated to education must address.

INTRODUCTION

During 19, 20 and 21 October 2021, Fundación Telefónica, IE University and South Summit held the **2021 enlightED Hybrid Edition**, an initiative that has brought together 470,000 unique spectators from 46 countries as well as 300 top international speakers since its inception in 2018, and in this short period has established itself as a global leader in the field of educational innovation.

The fourth edition of the global conference on education, technology and innovation, held in a novel hybrid format, attracted 147 leading national and international experts and thinkers.

Over the course of three intense days, which were staged in **Argentina, Brazil, Ecuador, Spain, Chile, Colombia, Mexico, Peru, Uruguay and Venezuela**, the challenges facing education in the 21st century were addressed, with a particular focus on the gaps that were already affecting education systems in most parts of the world, and which have been exacerbated by the COVID-19 pandemic.

This publication is structured into three parts, which focus on the analysis of each of these three major gaps in education and the search for possible solutions.

INTRODUCTION

The first part, ***Bridging innovation gaps in education***, addresses the transformations in education that are needed in the data-driven era: from training teachers in digital skills, to the search for equity, with a special focus on boosting technical and vocational training.

In the second part, ***Addressing the skills gap in relation to emerging societal needs***, important questions are raised such as the design of training curricula to respond to the demands of a constantly changing labour market, and innovative approaches to learning methods based on technology and a different understanding of the classroom.

The third part, ***Addressing the digital skills gap to reconnect with young people and to promote positive change***, raises awareness of the cultural divide affecting a generation of digital natives who are entering a school that clings to outdated models. This last section also raises, among other issues, the advisability of combining training in technical skills with the development of social skills.

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Part I:

In a few months, the COVID-19 pandemic brought to the educational landscape a transformation that would have otherwise taken years or even decades.

The first session of enlightED 2021 analysed the main changes in the education sector and the likelihood that these changes will be sustained over time.

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1 A NEW SOCIAL PACT TO BRIDGE THE DIGITAL DIVIDE

The effects of the coronavirus crisis were very much in the forefront of the conversation between Telefónica's Executive Chairman, José María Álvarez-Pallete, and tennis player, Rafael Nadal. According to the top executive of Telefónica, "in a week of confinement we advanced a year in terms of digitalisation"; something that was not pursued, but was instead imposed by the situation. And the world did not shut down, thanks to the Internet; a network that was not designed to keep 100% of the population confined to their homes to work, continue their studies, entertain themselves or shop, all via the Internet. And yet it worked.

Álvarez-Pallete expressed his conviction that nothing will ever be the same after the pandemic, and much of that is due to the unstoppable advance of technology. In connection to this, he said: "Technology is going to be a good thing, it has always been a good thing historically when people have been at the centre of it". The key, he believes, is to not forget that "this is not a world of machines, but of people". And, in the case of education, this conviction requires us to recognise that there are some things that cannot be digitised, such as empathy and companionship.

> **"Technology is going to be a good thing, it has always been a good thing historically when people have been at the centre of it [...] this is not a world of machines, but of people".**
>
> *José María Álvarez-Pallete*

Reinforcing this idea, he noted that we are witnessing the greatest accumulation of technological change that humanity has ever experienced and, as in other moments of profound transformation, this affects all areas: the economy, politics, culture and also the social arena. And, as in the past, the risk is once again the emergence of asymmetries, of inequality in access to the opportunities offered by technology.

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1 A NEW SOCIAL PACT TO BRIDGE THE DIGITAL DIVIDE

To ensure that these opportunities reach everyone, Álvarez-Pallete proposes a pause to establish a new social contract: "Technology can solve problems that seemed unsolvable, such as some diseases or climate change, but we need to take a pause to map out how we want this to happen. Otherwise, inequality will become socially unsustainable".
To ensure that these opportunities reach everyone, Álvarez-

"We need a human component; digital philosophers, doctors, anthropologists, lawyers and digital sociologists [...] this human component must be included in the social pact".

José María Álvarez-Pallete

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For the head of Telefónica, one of the difficulties in tackling the digital revolution is that people are not prepared to embrace exponential change. That is why, in his opinion, it is now time for the social sciences: "We need a human component; digital philosophers, doctors, anthropologists, lawyers and digital sociologists [...] this human component must be included in the social pact". A goal in which education must be key.

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1 A NEW SOCIAL PACT TO BRIDGE THE DIGITAL DIVIDE

Among the most original proposals to appear in the educational field, Álvarez-Pallete singled out Escuela 42: an experience in which Telefónica participates and in which students are trained without teachers, without textbooks and without conventional classrooms, and which is based on principles such as cooperation and learning to learn, and in which each person builds his or her own path.

Rafael Nadal observed that technology has changed the rules of the game in all areas of life, including sport. The tennis player, who admitted that he was not trained with technology, acknowledged that now the only way to convince a youngster to improve some aspect of their technique is to present them with data.

José María Álvarez-Pallete's final message was that the goal of society as a whole must be "that talent should have the best technology in order to progress". This is an opportunity that Spain should not miss, because "this is the first technological revolution that puts our country at the forefront".

> **"Our objective is to ensure that talent has the best technology to progress".**
>
> *José María Álvarez-Pallete*

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2 EDUCATION AFTER THE PANDEMIC

2.1 SPAIN: EUROPEAN FUNDS TO BRIDGE THE EDUCATION GAP

In her opening speech at enlightED, the Spanish Minister of Education and Vocational Training, Pilar Alegría, outlined the lessons learned during the pandemic. Among them, that the digitalisation process is not limited to devices or connectivity possibilities, but that, in her words, "we also need to significantly increase the digital skills of teachers and students and, perhaps even more importantly, to change teaching methodologies".

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Pilar Alegría

In the opinion of the Spanish Minister of Education, the European funds for the Recovery, Transformation and Resilience Plan must be a valuable instrument for overcoming the shortcomings detected during the pandemic. In total, the European plan allocates around 7.3 billion euros to education and the development of digital skills, of which around 1.5 billion goes directly to the digitalisation of the education system. Along with Vocational Education and Training and equality, digitalisation is one of the three pillars of the education plan. Among the items included in this investment, the minister highlighted the 300 million euros earmarked for the training of some 700,000 teachers in digital skills, and the 110 million euros that will go to the Digital Vocational Training Plan.

Alegría also expressed her conviction that, in parallel to digitalisation, it is necessary to move towards a skills development approach, in which students learn to learn, to work in teams, to understand, to apply the knowledge they have acquired and to develop critical thinking.

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2 EDUCATION AFTER THE PANDEMIC

2.2 LATIN AMERICA: THE FIGHT AGAINST INEQUALITY

To discuss the effects of the pandemic on Latin American education systems, enlightED held a session with education officials from the governments of Ecuador and Brazil: María Brown and Milton Ribeiro, respectively.

With regard to the impact of the global health crisis, the Ecuadorian minister began by mentioning two positive effects: the strengthening of the link between families and the educational community, and a greater awareness of the importance of education. But, of course, the negative consequences are more numerous and more intense. In quantitative terms, the pandemic had an impact on the Ecuadorian national budget, resulting in a reduction in the amount of money spent on education and, therefore, on the maintenance of infrastructure and equipment. For Maria Brown, the main qualitative effect of the pandemic on education in her country was the increase in the drop-out rate: "We already had high exclusion rates before the pandemic, about 300,000 school-age children who were not in the education system. In addition to this, around 120 000 students have reported no contact with their teachers during the pandemic".

The measures adopted by the Ecuadorian government to address this situation began by encouraging an urgent return to classroom attendance with the vaccination of 9 million citizens in 100 days.

There was no face-to-face contact, and only from 7 June 2021 did the country restart a process of returning to the classroom, with all that it implies. The Ecuadorian politician explained that a national education plan was launched, with five main thrusts: the reactivation of the education system, the promotion of measures to link schools to communities, the reduction of administrative obstacles to adapt curricula to the different situations, a rethinking of the professional teaching career, and, lastly, a firm commitment to excellence, with the integration of technology in education, with an emphasis on sustainable development and the promotion of healthy lifestyles.

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Milton Ribeiro, Brazil's Minister of Education, began by underscoring the exceptional nature of a huge country with a federal structure and which, in basic education alone, has 47.3 million students, 179,000 schools and 2.2 million teachers. Magnitudes that justify the need for a major effort in terms of management.

The head of education of the government of Brazil, one of the last countries to reopen classrooms, alluded to the liberal vision that characterises President Jair Bolsonaro. An ideological approach which, the minister acknowledges, has led to clashes with teachers' unions and education professionals who, before returning to the classroom, demanded guarantees, starting with their own vaccination.

The Brazilian government's initiatives to restore normality in education began with a diagnosis of the problems. Urgent measures were then taken, such as establishing afternoon and evening class schedules, and meals for students from the most disadvantaged groups were guaranteed.

More than 700 million was allocated to this programme, benefiting 46 million pupils in public schools.

"A priority must be the fight against gender inequality through education in order to reduce the gaps in access to employment, especially in careers linked to science, technology, engineering and mathematics, which are among the most in-demand in the employment market".

María Brown

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Addressing the central argument of the meeting - what decisions are the three governments represented at the conference taking to improve the employability of their students in a work environment undergoing disruptive change? Maria Brown acknowledges that in her country, too, there is a stereotype of vocational education as a second-class education, and recalls that goal four of the Sustainable Development Goals refers to technical education and access to employment.

To address this challenge, Ecuador has set itself the goal of reducing the gaps in connectivity and access to information in rural communities. For the Ecuadorian minister, "a priority must be the fight against gender inequality through education in order to reduce the gaps in access to employment, especially in careers linked to science, technology, engineering and mathematics, which are among the most in-demand in the employment market".
Milton Ribeiro's response begins with a categorical statement: "In this time of pandemic, the key players have been doctors, health professionals and hospitals. In the post-pandemic, it is likely to be teachers, education professionals and schools. It is something we have on our shoulders. We are the protagonists in this post-pandemic phase.

"In this time of pandemic, the key players have been doctors, health professionals and hospitals. In the post-pandemic, it is likely to be teachers, education professionals and schools.

Milton Ribeiro

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For Ribeiro, each country must find its own path, in line with its own peculiarities. As an example, the minister proposes the solution that Brazil has found to facilitate internet access for remote schools while respecting the environment: the use of riverbeds as fibre-optic routing paths.

In terms of boosting digital skills, Ribeiro underlines the possibilities of gamification, and refers to the adaptation to Brazilian Portuguese of the Finnish app GraphoGame, which already has more downloads in Brazil than in Europe. But before digital literacy there is literacy, without adjectives: the foundation of all learning. In this respect, he mentions the success of the campaign promoted under the slogan: "Learning to read for reading to learn".

At the enlightED talks in Brazil, particular emphasis was placed on the importance of combating all forms of discrimination, especially those based on ethnicity or race. Samuel Emilio, founder of the Diário Antirracista project, recalls that structural racism is one of the major indicators of inequality. In that sense, he advocates anti-racist education as a powerful instrument of social justice. To put it into practice, the São Paulo public network operators, Cibele Racy and Paula Beatriz de Souza, recommend starting with welcoming actions, active listening and creating a sense of belonging that extends to the whole school community.

Brazilian businessman and social activist Celso Athayde argues that for most groups that suffer discrimination, such as the

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African-American population or those living in the peripheries of large cities, there is a crisis that has been present for a long time: the crisis of future prospects: "When a young person is not represented in school and, at the same time, has to worry about survival every day, the school space becomes meaningless".

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Celso Athayde

Anti-racist education that is connected to the reality of these young people increases not only engagement, but also the construction of diverse solutions for the school community.

Beia Carvalho, founder of Five Years From Now, points out that understanding that constructions in the 21st century are achieved through cooperation rather than competitiveness brings us closer to innovation. Silvana Bahia, co-executive director of Olabi, also advocates collaboration, adding empathy and recognition of diversity as principles to be fostered, the latter of which she believes is key to promoting the inclusion of historically marginalised groups in the development of technological resources. Complementing the vision of the social entrepreneur, João Souza, believes that the key to projecting such vulnerable groups into the future is to bring them closer to multidisciplinary training.

BRIDGING INNOVATION GAPS IN EDUCATION

3 THE CHALLENGES OF VOCATIONAL TRAINING

3.1 SPAIN: COMBATTING NEGATIVE STEREOTYPES

To address the fundamental issue of Vocational Education and Training (VET) in Spain, the 2021 edition of enlightED brought together three experts in the field: Ainara Zubillaga, Director of Education and Training of the COTEC Foundation, Juan Carlos Lauder, General Manager of CaixaBank Dualiza, and Juan Carlos Tejeda, Director of the Education and Training Department of the CEOE. Three institutions which, together with Fundación Telefónica, have produced the report *Los desafíos para el futuro de la FP en España* (The challenges in the future of VET in Spain).

The moderator of the discussion, Luis Miguel Olivas, Director of the Employability and Educational Innovation Area of Fundación Telefónica, introduced the debate by providing some facts and figures: In Spain, only 12% of students study Vocational Education and Training, compared to the European average of 29%. A figure that contrasts with the fact that almost 40 % of current job offers ask for VET profiles; a demand that is expected to rise to 65 %.

Zubillaga set out the basic outlines of the report, which are condensed into 12 key proposals or points, distributed according to the actors involved. The recommendations to public administrations emphasise the need for a joint commitment with schools and companies, the promotion of digitisation and digital literacy, and the creation of specific spaces and projects for VET.

The report calls for a commitment by SMEs to training, the establishment of spaces for effective dialogue between all agents, beyond mere declarations of intent, and a firm commitment to dual training. With regard to teaching staff, the COTEC representative pointed out that the report calls for new skills, a more flexible regulatory framework to respond, with new qualifications and new profiles, to a rapidly changing employment market, and also greater coordination between internship tutors and academic tutors. Finally, under the heading of Other agents, the report underlines the importance of career guidance, the relationship with universities and the improvement of the social prestige of VET. For Zubillaga, this prestige must go hand in hand with an increase in the presence of women in vocational training.

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Juan Carlos Lauder attributes the traditional difficulties of VET to a lack of knowledge. "There is a biased image of vocational training that associates it with someone in blue overalls with grease stains on them, when nowadays those who come out of these studies are more often using white coats and tablets". For Lauder, it is essential to raise awareness of the employability of VET and the fact that demand for VET profiles outstrips supply. However, he believes that VET should not only be linked to employability, but should also be seen as a pathway, studies that do not end, because they should continue throughout life, and that can be completed at university, and vice versa: The number of university students extending their training in vocational education and training is increasing. The director of Caixabank Dualiza argues that digitalisation should be introduced in VET, but not only in terms of technical knowledge, but also in transversal skills, such as critical thinking or the ability to work in a team; digitalising VET, in his opinion, also means teaching in a different way.

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Juan Carlos Lauder

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Returning to the subject of employability, Juan Carlos Tejeda proposes that a double message should be sent to young people: on the one hand, that without qualifications it will be very difficult for them to enter the job market. On the other hand, VET studies, even now, have a higher employability than university studies. On the willingness of companies to take on VET profiles, Tejeda believes that they have no choice, and provides data: "According to CEDEFOP (European Centre for the Development of Vocational Training), in 2025, 49% of the jobs required by companies will be medium-qualified, i.e. VET; 37% will be high-qualified, and only a small percentage will be low-qualified".

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Tejeda sees more difficulties in the assimilation by SMEs of the advantages of VET profiles, especially with regard to dual training, as they lack training budgets, departments and the knowledge to carry it out.

Ainara Zubillaga reflects on the gender prejudices surrounding technology: "It is said that women should embrace technology, not that technology should embrace them". In her opinion, one way to change this trend is to transform the underlying discourse on technology: from the physical tool, "the gadget", to the purpose. Teaching how a dialysis machine works is not the same as reinforcing the message that it is a life-saving tool.

Olivas raises a traditional blight on VET: high drop-out rates, which are three times higher than those of the baccalaureate. How can we tackle them? For Lauder, it is very important to reinforce the prior guidance, because the cliché that persists in families is that if the student is doing well, he/she should go to university, while if he/she is doing poorly, he/she should enrol in vocational training. In any case, he argues that guidance should come from the whole teaching team, as the best counsellor for a pupil is

"It is said that women should embrace technology, not that technology should embrace them".

Ainara Zubillaga

the teacher. Zubillaga points out that the apparent fatigue of teachers with regard to training is more a rejection of the type of training they receive.

As a final message, Tejeda affirms that there is no competitive company without competent teams, and that competence is acquired with immediate, more hands-on and more technological VET. Lauder advocates finding meeting places for teachers to exchange experiences. And Zubillaga believes that the innovative teacher model, which has little impact, is being abandoned in favour of the school and project model, which is what really drives change.

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3 THE CHALLENGES OF VOCATIONAL TRAINING

3.2 LATIN AMERICA: MODERNISING THE EDUCATIONAL STRUCTURES

The broad consensus that exists on the need to adapt people's training to the needs of the job market in the era of the digital revolution does not usually translate into assigning the same importance to higher education as to middle-level studies. A shortfall that contrasts with all the analyses, which point to a greater demand for this type of technical-vocational training.

Ana Capilla, Director of Higher Education and Science of the Organisation of Ibero-American States; María Loreto Ferrari, Rector of the Instituto Profesional AIEP of the Universidad Andrés Bello in Chile; Ana Inoue, Head of Education and Employment at the Itaú Foundation for Education and Culture in Brazil; and Nancy Huerta, Director of Dual Education of the Under-Secretariat of Higher Education of Mexico met to further reflect on the present and the future of these studies in the Latin American context.

In order to contextualise the debate, Ana Capilla provided data on the situation in two of the countries represented at the meeting.

In Chile, around 12% of students choose vocational training, i.e. some 600 000 young people. On the positive side, Capilla pointed to the varied educational offer in this country, as well as the high transition between technical-professional and advanced secondary education, which stands at around 44 %. In the case of Mexico, the percentage of students opting for these studies is 8 %, which, given the Mexican population, means almost three million students.

María Loreto Ferrari took stock of the problems affecting vocational training in Chile. Among them, the lack of adequate articulation between training segments: secondary technical education, higher technical education and eventually university. In his opinion, one of the reasons for this gap is the lack of uniformity in the profiles of technical secondary education qualifications, which makes it difficult for institutions to recognise these skills across the board.

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On the other hand, Ferrari points out, the university environment in Chile is very traditional, and has a strong bias against technical education. Another problem is that large companies, the ones most likely to invest in vocational training, account for barely 20 % of the total, and are concentrated in two or three areas of the country. Lastly, for the rector of AIEP, a challenge that Chile must face is that of making its education system more flexible, as it suffers from a great deal of rigidity, for example, in its accreditation processes. All this in a country where 40 % of the 1 200 000 people enrolling for the first time in higher education opt for technical education, i.e. 500 000 students.

As Milton Ribeiro, Brazil's current Education Minister, commented, Brazil has embarked on a profound reform of its education system. Ana Inoue explained the changes that this reform has brought about in vocational training. The first concerns the time load: "Before, secondary education was 2 400 hours, over three years. 800 hours per year, on average, four hours of class per day. Now, the minimum is 3 000 hours, i.e. five hours a day, of which one part is a common core curriculum, compulsory for all and the same for everyone, of about 1 800 hours, and the other 1 200 hours can be offered in five itineraries, of which one is the technical-vocational itinerary". For Inoue, however, the fundamental change is that from now on all secondary schools in Brazil can offer vocational and technological education. A great opportunity to expand enrolment in vocational education, which is now around 12% of middle-level education enrolments.

Nancy Huerta presents the current situation of vocational-technical education in Mexico. There are two levels of education in the country: middle-level education, with students aged approximately 15 to 18, and higher education, which includes university technical studies and some bachelor's and engineering degrees, for those aged 18 and over. The number of students in the technological baccalaureate and technical vocational baccalaureate is about two million.

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As Capilla points out, one of the great challenges of the present time is to re-qualify workers, to adapt their training to the constant changes in the employment market. Ferrari stresses that in Chile between 30 and 40 % of the workforce has no higher education, a huge challenge that, in her opinion, is not being adequately addressed: "We, as educational institutions, have often been offering what we can offer and not what the student needs".

"We, as educational institutions, have often been offering what we can offer and not what the student needs".

María Loreto Ferrari

Ferrari explains that one of the difficulties in meeting this need is the poor connectivity of some areas in a country as large as Chile. She also proposes a solution: "Maybe it's not a house connection. Perhaps the public entities themselves may have to have connection centres, and we will have to demand that the telephone companies not only provide 4G or 5G from Santiago to Concepción, otherwise you go out 100 km and the connection starts to fail".

Ana Inoue explains that in Brazil only 20 % of 18-24 year olds are in higher education.
In her opinion, "with the pandemic, it has become clear that pupils are not only looking for vocational education, but also for what we call youth and adult education, which is the educational offer for older pupils, i.e. pupils who are older than the desired age for middle-level education".

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"With the pandemic, it has become clear that pupils are not only looking for vocational education, but also for what we call youth and adult education, which is the educational offer for older pupils, i.e. pupils who are older than the desired age for middle-level education".

Ana Inoue

Many states are organising themselves to cater for these people who, instead of pursuing middle-level education, will pursue youth and adult education. Inoue points to an objective that has appeared in all enlightED colloquia that have dealt with vocational-technical education: to do away with the negative stereotypes that plague this type of training, and in particular with the idea that it is something from the 20th century, and does not relate to new technologies.

The Mexican government's head of dual education explained the initiatives they have developed in this regard: The General Education Law of 2019 contemplated dual training within middle-level education, but since 2013 it had already been working with the productive sector, through Mexico's major business chambers, in an alliance that has managed to be maintained over the years. In this way, the Mexican model of dual training for the training of middle-level technicians was created with a great deal of support from international cooperation, especially from Germany.

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"80% of companies are satisfied with dual training. 94% of the students are also satisfied and recommend this educational modality".

Nancy Huerta

According to the surveys, the results are favourable: "80% of companies are satisfied with dual training. 94% of the students are also satisfied and recommend this educational modality".

BRIDGING INNOVATION GAPS IN EDUCATION

4 EMPOWERING, TRAINING AND ADVISING TEACHERS INTO THE DIGITAL AGE

The co-founder and CEO of Teach for All, Wendy Kopp, in her conversation with Magdalena Brier, Director-General of ProFuturo, explained that this organisation is in turn a network of locally run independent organisations in 60 countries. Entities sharing a common goal: the fight against educational inequality, based on the conviction that the circumstances of children's birth determine their academic and life outcomes. The teachers of Teach for All undertake a two-year commitment to teach in under-resourced communities; after this period, they never stop working and end up partnering with others to bring about the necessary changes at all levels of the education system and beyond.

Magdalena Brier recalled a recent OECD report showing that in the last two decades, before the pandemic and despite education reforms and increased spending, student learning outcomes in OECD countries had not improved at all. Meanwhile, as Brier pointed out, in 2019 the World Bank spoke of "learning poverty" to refer to a terrible reality: 53% of ten-year-olds in low- and middle-income countries were unable to read and understand a short text appropriate to their age, a figure that exceeded 80% in the poorest countries.

Admitting that the overall situation is not good, Kopp expressed some optimism: "We have found that if there are enough people working together to ensure that

> **"We have found that if there are enough people working together to ensure that all children reach their potential, you see sustained collective progress in the children."**
>
> *Wendy Kopp*

BRIDGING INNOVATION GAPS IN EDUCATION

4 EMPOWERING, TRAINING AND ADVISING TEACHERS INTO THE DIGITAL AGE

all children reach their potential, you see sustained collective progress in the children." That is what gives us strength. These communities demonstrate what is possible and show us that together we can improve the whole system".

For Brier, one positive effect of the pandemic has been to put education at the centre of the global debate: "As we live in an interconnected and changing world, the need for change in education is even more apparent".
The director of ProFuturo was convinced that in the fight against educational inequality, it is essential to train teachers in digital skills. In this regard, she noted that in the last five years the organisation has trained more than 900,000 teachers in 40 countries in Latin America, the Caribbean, Africa and Asia.
On the collaboration between ProFuturo and Teach For All, she added that in 2020 they launched a joint teacher development project in Africa that trained more than 15,000 teachers in three countries, and this year is expected to train 13,000 more in five countries.

"As we live in an interconnected and changing world, the need for change in education is even more apparent".

Magdalena Brier

BRIDGING INNOVATION GAPS IN EDUCATION

4 EMPOWERING, TRAINING AND ADVISING TEACHERS INTO THE DIGITAL AGE

Wendy Kopp agreed with Brier on the awareness raised by the coronavirus crisis, especially in terms of the potential of technology to accelerate learning and make it more accessible. However, her experience with people who have led some of the innovations in educational technology prompts her to clarify its importance: "Technology is the easy part. The challenge is to develop oneself and the teaching profession to know how to make the best use of this technology so that children can benefit from it".

"Technology is the easy part. The challenge is to develop oneself and the teaching profession to know how to make the best use of this technology so that children can benefit from it"

Wendy Kopp

Brier and Kopp agreed on the conviction that the increase in educational inequality requires a great collective effort. In this respect, the director of ProFuturo recalled a statement contained in a Commission document on the UNESCO's *Futures of Education*: "You can learn everywhere, but there is nothing spontaneous about education. It requires intentionality, planning and systematisation because it does not occur naturally or spontaneously".

BRIDGING INNOVATION GAPS IN EDUCATION

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5 EXCELLENCE AND EQUITY IN A WORLD OF DATA

Wayne Holmes, research consultant and lecturer at the University College of London, and Bob Hawkins, Global Director for Education Technology and Innovation at the World Bank, discussed two basic priorities in education, which sometimes appear to be incompatible: excellence and equity.

Holmes began by defining both terms. In his view, "educational excellence is not about young people learning facts and formulas, or taking exams or other easily quantifiable activities. It is about helping them to fully develop their individual potential to live a fulfilling life and make a positive contribution to society".

In terms of equity, he believes that it relates to the outcomes that these young people can achieve, and involves recognising that for all young people to reach their full potential, equal opportunities are not enough: "Limiting ourselves to giving the same opportunities to all does not imply that everyone will achieve all that they can".

> **"Limiting ourselves to giving the same opportunities to all does not imply that everyone will achieve all that they can".**
>
> *Wayne Holmes*

For Hawkins, excellence would be linked to what he calls "growth mindset", a concept related to the ability to act and to define oneself, excellence without limits, but also with struggle and perseverance because, in his opinion, "failure does not define you, it helps you to identify future paths, to grow as a person, as a student, as a citizen of the world".

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5 EXCELLENCE AND EQUITY IN A WORLD OF DATA

"Failure does not define you, it helps you to identify future paths, to grow as a person, as a student, as a citizen of the world".

Bob Hawkins

The moderator of the debate, Maira Cabrini, recalled some figures provided by the World Bank, which speak of the large education gap suffered by low and middle-income countries: There are some 258 million children in the world who are not in school; as Magdalena Brier pointed out, more than 50% of ten-year-olds are unable to read and understand a short paragraph well; a figure that rises to 80% in the poorest countries. In view of this situation, in order to bridge this gap, in what form should the EdTech be used?

Bob Hawkins, coordinator of a study on this subject, summarises the strategy for the use of Edtech in five principles: • The first is: "Ask why". What change do you want your investment to bring about? How will learners' skills change? What dynamic between teachers and students do you hope to achieve? How will such investment enrich the curriculum?

• The second: "On a large scale and for all", which he explains as follows:
"If you focus on the most disadvantaged and the least connected and develop solutions to reach those people, those schools, teachers and students, then you can scale up to the socio-economically richer parts of a country. It is an outward and inward task.

• The third principle is: "Empower teachers", because education is a social commitment fpr which teachers are the centre point. Therefore, they need to be supported to stimulate students and help them with their problems, and not only to teach a syllabus and mark exams.

• The fourth principle, "Engage the ecosystem", is based on the recognition that Edtech has multiple dimensions, many linkages: "You can't just buy tablets and expect them to work their magic [...] you have to look at the whole ecosystem and use it as a network to support education".

• And the fifth principle is: "Data-driven', because, assuming that the important aspects of excellence are difficult to measure, there is an opportunity to start measuring some of these 21st century skills.

BRIDGING INNOVATION GAPS IN EDUCATION

5 EXCELLENCE AND EQUITY IN A WORLD OF DATA

Regarding the role that artificial intelligence can play in education, Wayne Holmes sets out three levels:

- On the one hand, there is artificial intelligence (AI) learning, the use of AI tools to support teaching, both for students and teachers.

- The next area is learning about AI: learning how AI works, how to create it.

- And the third level, which overlaps with the previous ones, is about preparing ourselves to live in a world increasingly dominated by AI. What are the implications? What are the risks to society? What are the advantages? How to put AI at the service of humanity?

That said, Holmes expressed scepticism: "Despite much hype about how AI will transform education, the benefits are far from clear at the moment. There are very few independent evaluations of existing AI tools [...] AI is quite mediocre, at least in its current versions, which do not help young people to develop those skills".

"Despite much hype about how AI will transform education, the benefits are far from clear at the moment"

Wayne Holmes

What is the point of talking about technology's ability to bridge the education gap when 40% of the world's population does not have access to the Internet? Hawkins explained that a study conducted during COVID's toughest period revealed that there was a major problem for students in accessing education from home: "New skills required by teachers have become apparent, not only digital, but also about digital pedagogy, how to teach effectively in *online* environments, as well as the participation and interaction with parents".

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5 EXCELLENCE AND EQUITY IN A WORLD OF DATA

Holmes advocates the need to bring technology both to less developed countries and to certain rural areas in more developed countries: "We must focus on the problems and not on the symptoms of the problems.
The symptoms are that young people are not getting the education they deserve. But the problem often stems from the fact that teachers in these places are under-qualified, under-trained and inexperienced." In his opinion, much remains to be done: "We can use AI to help those teachers develop. However, in the research world, there has been almost no work on ways to use AI to directly support teachers". He concludes: "We need to be clear about what we want to use technology for. We have to be clear about what problem we want to solve and not just look at the symptom, but go to the core of the problem and develop technology that allows us to deal with it and solve it."

"We can use AI to help those teachers develop. However, in the research world, there has been almost no work on ways to use AI to directly support teachers".

Wayne Holmes

BRIDGING INNOVATION GAPS IN EDUCATION

5 EXCELLENCE AND EQUITY IN A WORLD OF DATA

On the matter of the extent to which technology can replace the social environment in a child's life, Hawkins emphasises the possibilities offered by the new tools to establish links that were not possible before, and to expand the traditional space of a classroom in which a teacher is the only source of knowledge and information for 40 pupils: "The combination of the two cultures, that of education at the teacher level and that of the providers, goes a long way in expanding the tribe".

"The combination of the two cultures, that of education at the teacher level and that of the providers, goes a long way in expanding the tribe".

Bob Hawkins

For Holmes, it is important not to be seduced by the hype surrounding the capabilities of technology: "There are tools that can be very effective, but I think the authorities should be a bit more careful, and they have to get involved, or at least encourage and fund research, so that we are not just creating tools to automate bad pedagogical practices.

BRIDGING INNOVATION GAPS IN EDUCATION

6 LESSONS FROM THE PANDEMIC FOR SCHOOLS

What lessons can be learned from a global crisis, which in the field of education has resulted in the closure of schools and universities, affecting 3 billion pupils?

Olli-Pekka Heinonen, Director-General of International Baccalaureate, believes that the pandemic has made it clear that education, learning and teaching form a system with distinct parts that are highly interconnected. And he is convinced that the traditional way of regulating from the top down can no longer work, because if it does, innovation will not come: "It's not about regulating with big actions, but doing it in a way that builds the capacity to innovate across the system, and also builds the resilience in schools to embrace that new learning".

"It's not about regulating with big actions, but doing it in a way that builds the capacity to innovate across the system".

Olli-Pekka Heinonen

Three school leaders from IB World Schools gave their views on their experiences of the pandemic. Andrew Rattue, Principal of St. Clare's, Oxford, points to a psychological aspect: "There are more insecure or somewhat anxious students who have benefited from the anonymity of online education, as the more dominant students no longer monopolised the discourse as much".

BRIDGING INNOVATION GAPS IN EDUCATION

6 LESSONS FROM THE PANDEMIC FOR SCHOOLS

On the other hand, he believes that the *online* platforms, such as Teams, have proved to be a good tool to facilitate comments on written works, and thus serve as a repository of academic materials. Above all, he believes that the importance of community has been reinforced: "Personal contact with friends and classmates is essential, and we have witnessed the joy of our students returning to class last year and this year without having to wear masks, and there was a sense of liberation".

"Personal contact with friends and classmates is essential, and we have witnessed the joy of our students returning to class last year and this year without having to wear masks, and there was a sense of liberation".

Andrew Rattue

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6 LESSONS FROM THE PANDEMIC FOR SCHOOLS

Carma Elliot, president of United World College's Southeast Asia campus in Singapore, agrees that the pandemic has strengthened the sense of community in difficult and dysfunctional times. And she highlights another favourable consequence: "One very positive effect of the impact of the pandemic is that it has helped us to raise awareness of the importance of the next steps for the Sustainable Development Goals".

"One very positive effect of the impact of the pandemic is that it has helped us to raise awareness of the importance of the next steps for the Sustainable Development Goals".

Carma Elliot

Furthermore, the Director General of the International School of Geneva, David Hawley, points to two effects of the COVID-19 crisis: one which he defines as prosaic, and the other more philosophical. The first relates to the fact that many face-to-face sessions with parents to report on their children's progress have been saved, thus avoiding travel and its associated climate footprint. His "philosophical" observation is that the pandemic has reminded us that "when we are online, we have access to the best. No matter what you teach, there is sure to be someone in the world who teaches it better than you. And also... it's free".

"[One lesson of the pandemic is that...] when we are online, we have access to the best. No matter what you teach, there is sure to be someone in the world who teaches it better than you. And also... it's free".

David Hawley

BRIDGING INNOVATION GAPS IN EDUCATION

7 COMPUTER GRAMMAR

Linda Liukas, programmer, children's author and founder of Rails Girls, a global movement of programming workshops for girls, participated in enlightED 2021 to talk about her vision of how early technology education should be approached. Liukas, who began by questioning the slogan of the meeting - "If code is the new lingua franca, we need poetry lessons as well as grammar lessons" - expressed her conviction that stories are necessary to engage children's interest because they help us make sense of the world and connect us to each other: "Narrative has enormous power; it is the way in which human beings learn about themselves and others".

Liukas, creator of the character of Ruby, a girl programmer, believes it is essential to combat the limiting ideas that, from an early age, keep girls away from technology. Based on her experience promoting the introduction of IT to children, she recommends stimulating their curiosity, "instead of transferring technology, you have to awaken the child's interest by creating memories around technology that empower them, that give them autonomy and the feeling that they can make decisions in this small universe". In addition, Liukas believes it is very important to take an optimistic approach to technology. In her opinion, while those who brought about the *boom* of the digital era in the 1980s lived in sunny California and, like Bill Gates,

"Instead of transferring technology, you have to awaken the child's interest by creating memories around technology that empower them, that give them autonomy and the feeling that they can make decisions in this small universe".

Linda Liukas

had a positive vision of the future, today's generations see a gloomier scenario, with bleak prospects such as that presented by climate change. In the opinion of this expert in introducing technology to children, we must at least give a hopeful vision to those who in a few years' time will be driving the digital revolution.

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

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Part II

The 2021 edition of enlightED devoted a day to discussing what students should learn in an era dominated by new technologies and global issues such as pandemics and the climate crisis.

As a basis, key questions such as: What are the competencies and skills employers will seek? What constitutes useful and relevant knowledge? What attitudes can be taught and learned effectively in a classroom?

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

8 PREPARING FOR JOBS THAT DO NOT YET EXIST

A preliminary question to the issues that open this chapter gives an idea of the complexity of the task of answering them: How can we train the new generations when we are largely unaware of the jobs they will have in their working lives?

Michelle Weise, Vice-Chancellor of Strategy and Innovation at the National University System and author of *Long Life Learning: Preparing for Jobs that Don't Even Exist Yet*, reflected on the problem, trying to go beyond mere rhetorical statements: "I have always found it fascinating to go to congresses, and to find these round tables of presidents, directors and chancellors who continually insist on the importance of lifelong learning, but do nothing to make it possible".

"I have always found it fascinating to go to congresses, and to find these round tables of presidents, directors and chancellors who continually insist on the importance of lifelong learning, but do nothing to make it possible".

Michelle Weise

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

8 PREPARING FOR JOBS THAT DO NOT YET EXIST

In Weis' view, the current vision of lifelong learning is more about those who are about to retire, those who have worked all their lives and can now do whatever they want, but she believes that we need to go further. It is with this conviction that she has developed the concept of "lifelong learning"

As this expert says, the first people who will live to be 150 years old have already been born, and this should make us think about the need to continue learning and recycling our training in order to be able to have a working life of 60, 80 or 100 years. In this respect, she observed that in her own country, the United States, people are already working much longer than they had imagined: those who are over 60 and 70 and still working, and those who are retiring have changed about 12 times before they retire. If this is already the case, Weise does not think it is too far-fetched to anticipate that we will change jobs 20 or 30 times in the future.

This is why she proposes a change to an approach that is designed for younger students who are able to study full-time, rather than for those who have to combine education with work. One problem that Weise detects is the rigidity of the structures: not enough gateways are created for students to move in and out of the job market.

But as we think about tomorrow, we need to address the present of the people the system is pushing aside, the 41 million people in the United States alone who have already been left behind. Weise believes that the debate on this issue has changed: years ago we were concerned about the lack of people trained in the careers that the jobs of the future would demand. Now, the expert argues, "we have to find the intrinsically human skills that make us competitive to keep our jobs or to coordinate better with machines and computers"

With that goal in mind, she believes that there is a need for what she calls "T-shaped workers and students", i.e. with generalist and broad human skills, as well as vertical technical or technological know-how.

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8 PREPARING FOR JOBS THAT DO NOT YET EXIST

If training in technical skills is something we know how to do, this is not the case for soft skills: "Empathy or emotional intelligence is not easily taught.
You don't learn them in six weeks and become emotionally intelligent".

In any case, Weise thinks that in the "post-Google" era it is necessary to change the way we learn and teach. When any data is on Google, and can be obtained at the click of a button, "the idea of problem-based learning should be much more important in our curriculum than it is now, when, in the last year of your degree, you might do a course that includes an internship where problem-based learning comes up".
She concludes: "We need the ability to manage ambiguous circumstances".

"The idea of problem-based learning should be much more important in our curriculum than it is now, [...] We need the ability to manage ambiguous circumstances".

Michelle Weise

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8 PREPARING FOR JOBS THAT DO NOT YET EXIST

And to train the problem solvers that society needs, the human element, emotional intelligence, is key. Collaborative skills need to be developed, people need to be trained to work in teams, among other things. That is why, in Weise's view, it is so important to change the paradigm of recruitment to include these kinds of skills: "Businesses need to do away with the requirements that create obstacles and, from the education system, we need to train students to quickly translate their skills into the language of the job market". In her view, the need to have a degree to access many jobs should be eliminated, and also, "the requirement of years of experience for essential workers should be eliminated. You can't have three years of experience at the age of 20".

As a final message, Michelle Weise proposes a change of mindset, of priorities, and a shift from jobs to people: "We have to shift the focus from the future of work to the future of workers".

"We have to shift the focus from the future of work to the future of workers".

Michelle Weise

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

9 HOW TO BOOST CREATIVITY AND INNOVATION

Carmen Morenés, Director General of Fundación Telefónica spoke with the creator of Segway human transport and founder of FIRST, Dean Kamen, about one ingredient of education that this inventor has been trying to develop for years: creativity. Kamen's commitment to creativity is part of his life experience. His time at the school taught him a lesson early on: "I understood that school is a place where you learn the basic rules, but you have to use your passion to understand what to do with all that. For me, school gives you the tools, but it doesn't teach you how to build anything with them".

Following his father's advice ("Find something you are passionate about, something you will do because of how much you love doing it, and do it so well that you can make a living doing something that you are passionate about. Then you will never work a day in your life"), Kamen emphasises the value of passion: "You have to find something that you are passionate about, that you love to do, and do it so well that you can contribute something to the world, and then the world will return the opportunity to build your life around that."

"You have to find something that you are passionate about, that you love to do, and do it so well that you can contribute something to the world, and then the world will return the opportunity to build your life around that"

Dean Kamen

In this spirit, Kamen created FIRST Robotics (For Inspiration and Recognition of Science and Technology) in 1989, a non-profit organisation that aims to stimulate interest in science and technology among young people. To this end, it organises competitions of robots built collaboratively by students, teachers and volunteers.

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9 HOW TO BOOST CREATIVITY AND INNOVATION

Carmen Morenés reminds Kamen of a quote of his, which sums up his intentions with FIRST: "I want to compete for the hearts and minds of kids with the enthusiasm of the Super Bowl".

Aware that sport is what appeals most to today's young people, Kamen devised one with two premises: that it would attract the interest of young people, but develop important skills for the future. "Our goal was to create a sport that is as much fun as the rest, but where every kid can become a professional".

And, in the same vein as Michelle Weise, Kamen argues for the need to create a global generation of problem solvers; people who, rather than answering posed questions, find new questions that no one has asked or, even better, find new answers that no one has thought of. Solving problems, yes, but always working as a team.

This is the idea behind the concept coined by this innovator, that of "coopetition": a harmonious combination of cooperation and competition. Aware that pure competition, the idea of winning at any price, can be negative, he adds to the thrill of competition the principle of collaborative search for solutions: "The cooperation in 'coopetition' is about everyone recognising that they have to learn from each other and support each other so that we can all improve."

For Kamen, the defence of collaboration is not only an ethical principle; it is also a deeply pragmatic attitude, something that the real world teaches us all the time. An excellent example of this, he says, is the achievement that a vaccine against COVID-19 has been developed in one year, an unprecedented achievement that, above all, is the result of collaboration.

Convinced that, as the poet William B. Yeats wrote, "education is not the filling of a pail, but the lighting of a fire", Kamen advocates instilling this passion in the education system: "Let those teachers create that environment outside the school. To light a fire in these children with the programme so that the next day they come into class and are as focused and eager to learn maths and science as they are when they are waiting to bounce the ball for three hours".

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

10 THE ROLE OF THE IMMERSIVE CLASSROOM IN DEVELOPING 21ST CENTURY SKILLS

After the intense experience of remote education, forced by the health measures derived from the COVID-19 pandemic, the convenience of changing the traditional models and developing others in which a new vision of the classroom and the relationship between peers are the keys to learning. Nick van Dam, director of the IE Center for Liquid Learning and Corporate Learning Innovation of IE University, and Corinne Vigreux, co-founder of TomTom and driving force behind the philanthropic organisation CODAM, a non-profit programming school, which has taken over the pedagogical initiative of school 42 in the Netherlands, discussed this topic.

For Vigreux, there are two aspects to consider when rethinking the way we learn. Firstly, the rapid evolution of the knowledge and skills demanded by the employment world: "You used to be able to last 10 or 20 years in a company with your skills. This is no longer the case".

The second is the evidence that a different kind of learning is needed: "There have been a couple of surveys published recently that reveal a lot of dissatisfaction on the part of students in higher education, because they are bored and they already have access to a lot of information in the way they consume it, so they are looking for something different". For the TomTom co-founder, while large parts of society have adapted to the new times, the current education system is very much like the one she knew when she was a student.

For Nick van Dam, everyone talks about the need to promote lifelong learning, but young people feel a considerable rejection of it. The reason he gives is that for most of those who have not had a good experience at school, the idea of lifelong learning is a continuation of a not very positive stage in their lives.

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10 THE ROLE OF THE IMMERSIVE CLASSROOM IN DEVELOPING 21ST CENTURY SKILLS

Vigreux shares this idea, and recounts her conversations with young students who admit to lacking any other stimulus in their education than earning money. An attitude to which the founder of CODAM has an answer: "Does what you learn bring you any enjoyment? Because you will have to work for a long time, and this education will give you the possibility to do something you enjoy. And if you like the work, it will have a positive impact on the company. It is a virtuous circle".

What needs to be emphasised in order to improve the training of the new professionals of the 21st century? Vigreux underlines four: the ability to learn how to learn, to be curious about your environment, and also collaboration, teamwork. The third ingredient of this new approach is resilience and failure management: "We all have to pursue innovation and, if we want to innovate, staff must be prepared to make decisions and take risks without fear of failure".

"We all have to pursue innovation and, if we want to innovate, staff must be prepared to make decisions and take risks without fear of failure".

Corinne Vigreux

Finally, Vigreux speaks of the need to foster the breeding ground for innovative and creative environments that emerge from diversity, from the encounter between people from different backgrounds and different lives.

As the founder of CODAM, the organisation that has incorporated Model 42 in the Netherlands, Corinne Vigreux emphasises the importance of peer learning, the stimulus to deepen knowledge that comes from sharing doubts and experiences with other learners.

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

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11 OUTLOOK FOR EDTECH

Felix Ohswald, founder of GoStudent, Liz Fleming evaluator in the Accelerator of the European Innovation Council (EIC), and Vinny Pujji, director of investment company Left Lane Capital, discussed the future of educational technology, and in particular the future of the business of online education.

From the privileged vantage point afforded by his position at GoStudent, Felix Ohswald reports some very significant facts and figures: European countries as a whole spend 4 % of their budget on education each year, i.e. some 980 billion euros. 20 %, i.e. almost EUR 200 billion, comes directly from households. For Ohswald, these figures speak of a great business opportunity. In his view, "digitalisation can make it easier for schools, teachers, children and parents to realise their full potential [...] For the market, it is a multi-billion dollar opportunity".

"Digitalisation can make it easier for schools, teachers, children and parents to realise their full potential [...] For the market, it is a multi-billion dollar opportunity".

Felix Ohswald

It was this conviction that led the venture capital fund Left Lane Capital to support GoStudent's initiative. Its director, Vinny Pujji, explains that in terms of education, the Internet offers something very similar to what platforms such as Airbnb or Uber offer: a large market made up of a public that has never used a service like this before, and now finds it accessible thanks to price and disruptive technology.

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

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Pujji gives his own version of why this market has not yet taken off. In his eyes, one of the causes is the "outdated" way in which education is culturally approached: "There is a long-standing idea that the government should fund education or provide it in some way. But we are in a competitive and increasingly globalised world, so if I want to be at the top of the class, I have to invest in it. More and more people are able to invest in it. We're not talking about 200 dollars an hour, we're talking about 25 or 30 dollars an hour". According to this investor, the Internet allows the education business to be scalable: "A centralised company now has to grow rapidly in many markets, and scalability is the opposite of the old education business model, which was point by point, school by school".

"A centralised company now has to grow rapidly in many markets, and scalability is the opposite of the old education business model, which was point by point, school by school".

Vinny Pujji

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11 OUTLOOK FOR EDTECH

For Felix Ohswald, the key is to understand that education is fragmented by nature, and to respond to that diversity: "There are many types of learning [...] If we want to build the biggest education company in the world, we have to combine everything, create that ecosystem of other companies, bring the models together, identify the benefits of each one, and then we can really develop the potential of the users and provide them with the ideal solution for each situation".

Jeff Maggioncalda, CEO of Coursera, one of the world's leading providers of *online* training content, and the Executive Chair of IE Exponential Learning at IE University, Teresa Martín-Retortillo, discussed the same topic.

Maggioncalda provided some interesting information on what people are looking for in *online* training. Each year, Coursera prepares its *General competency report* where it uses data science to analyse what the 87 million people registered on the platform are learning. Their studies show that there is a boom in Python programming, statistical machine learning, i.e. predictive analytics, data management, *big data*, and management of large cloud-based data packages. They also see a high demand for training in basic computer skills and languages that serve as working tools, such as JavaScript. Another area of great interest is user experience design.

Focusing on Spain, Maggioncalda pointed out the skills in which Spanish students are best. He stated that in the business chapter, Spanish Coursera users are in the 74th percentile in accounting, in the 71st percentile in entrepreneurship and in the 71st percentile in finance. In technology, the percentiles are 84 in cloud computing, 77 in programming and 79 in mobile development.

Lastly, in data science, Spanish students are in the 91st percentile in data analysis, in the 90th percentile in statistical programming and in the 73rd percentile in data management. According to the CEO of Coursera, Spaniards show a greater interest in budget management and business analysis than those in the rest of the world.

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11 OUTLOOK FOR EDTECH

The recent expansion of Coursera is a good example of the growing demand for *online* studies. As an example, Maggioncalda mentions the important collaboration of the company he manages with universities, such as IE. In this regard, in October 2019, Coursera for Campus was launched, which, unlike the enterprise version, allows any academic institution to deliver its courses to students at universities. At the end of the open courses, Coursera and each university issue a certificate, a micro-credential which, although it does not have the qualification of a university degree, is highly valued by companies.

Another type of micro-credentials are what Coursera calls "industry-recognised credentials", which it issues in partnership with large technology companies such as Google, IBM, Facebook or Salesforce.

According to Maggioncalda, we are witnessing a rapid and very positive process in which universities are modernising their degrees by combining and hybridising them with other micro-credentials, such as those on Coursera. "We are heading towards a world of collaboration and innovation that has never existed before," he said.

This collaboration makes the best of both worlds: "Universities are very good at conceptual training, [...] if you combine it with the conceptual learning that universities offer, the hands-on learning helps students to know how to apply those models to the use of concrete tools for concrete problems".

"If you combine it with the conceptual learning that universities offer, the hands-on learning helps students to know how to apply those models to the use of concrete tools for concrete problems".

Jeff Maggioncalda

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11 OUTLOOK FOR EDTECH

One of the weaknesses of *online* training is connectivity. This is why Coursera is working on applications that can work with intermittent connectivity. As an example of the difficulties faced by students in some parts of the world, Maggioncalda describes the case of Nigeria, where downloading two gigabytes of data costs, on average, 30% of a person's monthly income. For this reason, they are working on the so-called "reduced download", which allows access to courses without downloading all the frames, but only those containing the most relevant information.

For Maggioncalda, the experience of the pandemic has left a very promising effect: "*Online* learning is very valuable, but without employment opportunities, skills do not create economic opportunities and are of little use. Until the pandemic, work used to be local. The value of learning depended on local job opportunities. With remote work, if you have education and connectivity, there are millions of jobs". A point of view that Taha Bawa, the founder of Goodwall would insist on in his lecture.

ADDRESSING THE SKILLS GAP IN RELATION TO EMERGING SOCIETAL NEEDS

12 THE PHYSICAL AND THE DIGITAL: THE PURSUIT OF BALANCE

The omnipresence of screens in our lives is generating serious addiction problems, especially among young people. The need to find a balance in the use of new technologies and how to achieve it was the subject of the lecture given by the neurologist Ignacio H. Medrano, founder of Savannah: a platform that, by combining artificial intelligence and *big data*, collects qualitative information from millions of electronic medical records and provides, in real time, the best medical information available at the time.

The first step to solving the problem is to determine when a person is overusing digital tools. For Dr Medrano, the answer is simple: if you feel that you are abusing, you are addicted. And this does not happen by chance: They are designed for it: "We now know that things like the infinte *scroll* or the recommendation of personalised news are intentional". And, as has been proven, there is a direct correlation between the number of accounts we have on Facebook or Instagram and the degree of anxiety and depression we suffer from: "The time we spend in front of screens has a strong correlation with our unhappiness".

"The time we spend in front of screens has a strong correlation with our unhappiness".

Ignacio H. Medrano

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One of the reasons for the rise of this type of addiction, Medrano explains, is that our tolerance for boredom is decreasing. On the other hand, the neurologist reports, there is a belief that the more connected a person is, the more efficient he or she is at work. A false conviction, as recent MIT studies have shown. In fact, positive qualities for the workplace, such as creativity, teamwork or design, are affected by the abuse of tools.

There are many techniques to combat screen abuse. According to the creator of Savana, the key is to realise that in the digital realm there are no *stopping cues*, situations in which things come to an end: "Everything you do in the physical world has an end, at a certain point you reach the end point. The problem is that the digital world has no stopping cues. If you think about it, to paraphrase John Lennon, life is what happens while you're looking at your mobile phone".

"If you think about it, to paraphrase John Lennon, life is what happens while you're looking at your mobile phone".

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Part III

On the third day of enlightED, the speakers analysed the ways in which the so-called App Generation interacts with digital media and what can we do to help them to breach the digital divide but also to ensure that technology becomes a force of positive change, to develop meaningful social relations and to contribute to build a better society overall.

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13 DEDICATION, EXCELLENCE, ETHICS

The complex relationship between digital technologies and young people was the focus of the talks held between psychologist Howard Gardner, the founder of Design for Change, Kiran Bir Sethi and Pablo Gonzalo, Head of Knowledge and Digital Culture at Fundación Telefónica.

In his presentation, Gonzalo told the story of Julius Yego, the Kenyan javelin thrower who has been world champion and Olympic runner-up. Yego started throwing wooden sticks in his village. As he had no technical training or coach, he watched the best javelin throwers on YouTube and learned from them. In this way, he improved his marks, and finally got a coach; from there, the great international successes followed. For Gonzalo, the most amazing thing about his story is that when talking about his progression, the athlete does not particularly highlight technology or YouTube, but says, verbatim: "Education is very important, and it taught me to think about training on my own". As the Head of Digital Culture at Fundación Telefónica explained, Kiran Bir Sethi, an Indian educational designer and reformer, decided to open The Riverside School in Ahmedabad (India) when her children started going to school and she noticed the cold and rigid environment that surrounded the children. That 'different' school eventually became Design for Change, which is now a major global change and organisational movement made for children and by children. Kiran opened the dialogue by recalling the book *Five minds for the future*, which Gardner published in 2005, in which he proposed his theory of the five minds: the disciplined mind, the synthesising mind, the respectful mind, the ethical mind and the creating mind. In this sense, the Indian entrepreneur wondered whether 15 years later, and after the experience of the pandemic, it would be necessary to speak of a new mind, the resilient mind, which will help us to navigate between change and uncertainty.

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Gardner, after reiterating that all his work is based on studies regarding cognition, thinking, reasoning, problem solving, creation and synthesis, points out that resilience is neither a cognitive concept nor an aspect of interpersonal relationships, but a personality trait that falls outside his frame of reference. In any case, the psychologist believes that social and emotional learning, which is so much talked about nowadays, can be very selfish, as a socially intelligent person can use these capacities in a very abusive way: "If emotional and social skills don't connect us to others, but only lead us to be effective in the marketplace, I'm not too convinced".

"If emotional and social skills don't connect us to others, but only lead us to be effective in the marketplace, I'm not too convinced".

Howard Gardner

As Gardner reminds us, "interpersonal intelligence can be used to promote cooperation or to foster conflict and hatred". By way of example, he raises the negative effects of antivaccine resilience on society as a whole. On the other hand, he currently detects a deep sense of fear among the children, and fears that they are not well prepared to manage the changes in their understanding of the world. In his own experience, most children come to school having already had contact with resilience: from children of overprotective parents, to those who have lived in a carefree environment. In response, he poses a question to Kiran: What do you do, as a teacher and as a head teacher, with children who arrive with hyper-resilience, and others, with no resilience at all because they are afraid to make a wrong move?

Using the metaphor of the trapeze artist, the Indian educator believes that the key is to identify where children need a safety net and where they should be left to their own devices, conveying the message "You decide when to step up. We are here".

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Moving on, Kiran refers to Gardner's theory of good work, which is based on three elements: ethics, excellence and dedication. For the psychologist, it is not too difficult to define excellence and dedication: "Excellence is a more public concept that is evaluated by others. Dedication is obtained by training and winning, more or less, according to our state of mind and skills". But things get more complicated when we enter the realm of ethics and responsibility: "The demand for ethical behaviour increases if you are mentally and physically well [...] among the three elements, ethics, excellence and dedication, it is ethics that will be the most decisive".

How to act correctly in the absence of ethical references, how to continuously recalibrate our inner compass, Kiran asks. For Gardner, ideally one would have a range of mentors, and be able to take certain aspects from one, and certain aspects from another. However, it must be borne in mind that in the digital age it is easier to transmit lies than truths. In addition to mentors, in the life trajectory of the American psychologist, "antimentors" have been very important, negative or hostile references that, if they do not defeat you, make you more resilient.

On how the two ways of making decisions, neighbour morality and role ethics, fit in today's age, Gardner believes that for young children the priority should be neighbour morality, or what could also be called "the ten commandments of Western society": being kind, not hurting others, etc. In this sense, Gardner recognises that culture has a strong influence; as an example, he cites studies that show how different relationships with the family, the community or religion are in cultures such as Indian or Chinese compared to more democratic Western models.

On his own scientific output, Gardner says that he is currently finalising two compilation books: *The Essential Howard Gardner on Mind* and *The Essential Howard Gardner on Education*, which give him the opportunity to comment on where he has changed his mind or not to reproduce something he is no longer convinced about.

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14 EDUCATION IN THE DIGITAL WORLD. FROM THE ORIGINS OF THE INTERNET UP TO THE PRESENT AND FUTURE CHALLENGES

Vinton Cerf, one of the fathers of the Internet, talked with the CEO of IE University, Diego del Alcázar on the past and future of education in the network of networks.

On his role in the creation of the Internet, Cerf begins by underlining the fact that, like any major undertaking, that innovation required the collaboration of many people, starting with his colleague Robert Kahn, with whom he worked from the beginning on the design of a US Department of Defence project, which was looking for a way to use computers for command and control. So, he says, "it was not one of those 'one day I woke up with an exceptional vision' stories, but rather a solution to an engineering problem". Moreover, for the Internet to become what it is today, it has taken millions of people. On the other hand, he concludes in this regard, the World Wide Web, which is what most people know as the Internet, was not invented by Bob Kahn or him, but by Tim Berners-Lee, in 1991.

Regarding the prominence of the internet during the COVID-19 pandemic, and admitting that 3 billion students worldwide have benefited from the internet, Cerf believes that its use has been forced beyond the capabilities of most systems to make it work as well as possible.

Drawing on the analogy that Diego del Alcázar makes between the invention of the printing press and that of the Internet, and in particular the threat posed by the proliferation of hoaxes and lies, Cerf admits that the printed page and the Internet have several points in common; the first is that both the page of a book and the Internet do not know what is printed on it: they are deliberately neutral platforms, designed so that anyone can incorporate information. In the case of the Internet, this is a basic concept. The lack of theoretical barriers to expression, amplified by indexing systems such as Google, allows people to share and find information. But, as is evident, the problem with this technology is that there is nothing to stop us from sharing disinformation, misinformation or even harmful information, such as *malware, ransomware*.

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To avert the dangers of the dissemination of harmful content, Cerf believes that the idea of a kind of "internet licence", like the one that ensures that car drivers obey traffic rules, is not unreasonable. But it's not easy because, as the scientist admits: "The problem we face is that the internet is global by definition, so the offender may be under one jurisdiction and the victim under another, so cross-jurisdictional cooperation is necessary to prosecute offenders".

This idea leads him to the conviction that the total and absolute anonymity that exists on the Net is not a good thing. He therefore advocates that harmful acts should have consequences, which means being able to identify those who misbehave, to track down the people and organisations that do harm through the platform provided by the Internet. This requires a high degree of global cooperation. An extremely complicated challenge and one that shares a similar level of difficulty with another huge threat to society: climate change.

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Alongside the threats, Diego del Alcázar points out, globalisation offers great opportunities, which in the case of the Internet involve guaranteeing connectivity for the entire population, even those living in remote places. Vinton Cerf agrees with this assessment, and goes further: In addition to the connectivity gap, the physical accessibility gap, there is also a knowledge gap: " One has to know how to find relevant information that has to be locally relevant, in a language that the user speaks, someone has to maintain it, it has to be findable, and it has to be distinguishable from false or incorrect information".

Cerf links this reflection with the need to encourage critical thinking. "People should ask themselves: 'Where is this information coming from? Do these claims have any basis in fact?'. You have to think: 'Who published it and why did they publish it', and also: Is someone trying to get me to do something that I wouldn't otherwise want to do?

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In any case, there are physical barriers that need to be removed. To this end, Cerf advocates lowering the costs of connectivity devices, increasing investment in technologies such as 4G and 5G that connect us to the internet, and also making it easier for people with disabilities to access online information or computer equipment.

In an age dominated by the perception of rapid change, IE University's CEO proposes the idea of liquid learning, of constant adaptation to the growing possibilities offered by technology. From this vision, Cerf emphasises the possibilities of "just-in-time learning", of the Internet's ability to provide an instant response to virtually any information need. On the other hand, in agreement with all the experts who have visited enlightED and addressed this issue, Cerf stresses the importance of lifelong learning, with the prospect of 70 or 80 years of working life. But, he points out, you have to consider that people cannot give up everything to go back to school, to do another four-year degree: "In addition to intensive education in the early years of our lives, lifelong learning must be enabled. Online tools are fantastic for achieving something like this, and I think we will see a big evolution, even at the university level, towards materials that people use when they need to learn something".

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In Cerf's view, to move in this direction, digital tools are a very powerful aid, but a change of attitude is also needed, a new social awareness of learning: "I think that, as a society, we need to encourage a greater awareness of the value of learning new things [...] we need to reward the learner". A reward that starts with making learning fun and interesting, which requires teachers to create the right atmosphere.

In this necessary social transformation, says del Alcázar, the humanities have an essential role to play. Vinton Cerf agrees, and believes that one cannot understand what is going on without the basis provided by, for example, literature or philosophy: "The world is much more than a technical understanding of how things are. Understanding how people think and what motivates them is equally important". Humanities to assimilate technological developments, but also to connect them with computer science, a world that opens up when the term "computational" is added to other fields: computational physics, computational chemistry, computational biography or computational linguistics. In this sense, one of the creators of the Internet expresses his enthusiasm for the application of artificial intelligence and *machine learning* to fields such as philology: "Computer science is like a linguistic microscope that allows us to look at texts and understand them in more detail than ever before in history".

What recommendations does Vinton Cerf have for redesigning the education system in the future? The first can be summed up in the classic learning by doing, discovering the usefulness of what one learns: " *Just-in-time Teaching* works very well because you know right away, when you try to solve something, how useful what you have just learned is". The second recommendation, linked to the invitation to do things yourself, is to accept failures: "Making mistakes is one of the most effective ways of learning that I can think of".

"Computer science is like a linguistic microscope that allows us to look at texts and understand them in more detail than ever before in history".

Vinton Cerf

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15 *EDUTAINMENT:* NEW CHANNELS FOR LEARNING

Education and entertainment: How can these two activities be combined to improve learning, using powerful digital tools? Two experts in this field met at enlightED: David del Val, Director of Technological Innovation at Telefónica, and Yago Fandiño, Director of Children's Content at RTVE.

Fandiño recounted the experience of the programme *Aprendemos en casa*, launched by Spanish public television at the height of the pandemic. Its aim was to reach households that lacked Internet access and, according to the head of the project, the response from society as a whole was magnificent. Thanks to the involvement of textbook publishers, teachers and content creators who offered their archives, in less than 5 days we were able to offer 5 hours of broadcasting per day. The support of the families and the work of the Ministry of Education and RTVE teams enabled the programme to continue throughout the confinement period. Fandiño sums up the reasons for this success: "There was a social demand, and society reacted to meet that demand". One of the conclusions of this experience is that more content is needed outside of emergency situations; this was how we moved from *Aprendemos en casa* to *Aprendemos en Clan*: a programme that from Monday to Thursday offers didactic units for children between the ages of 6 and 10, in accordance with their school curriculum, which have been designed by the Ministry of Education and produced by RTVE.
On Fridays, for 10-12 year olds, it is television that goes into schools and invites pupils to debate current affairs.

In David del Val's opinion, *edutainment* is here to stay. On the two pillars of this concept, the head of innovation at Telefónica admits that in his project they came to education from television. Their initial approach was how to improve Movistar+, and to do so they surveyed their users, asking them why they watched the programming. Among the nine reasons given by the platform's customers were two that did not seem to be satisfied: personal growth and pure curiosity. This led to the creation of Movistar Campus, which offered free on-demand content with a priority objective: that the viewer would be entertained by learning.

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Beyond the purely television environment, del Val believes that the formula has a long way to go in developing the possibilities of smartphones. Mobile phone education has been around for a long time, the challenge now is to cater for those moments he calls "free head and busy body", such as those that occur in the media or gyms. Along the same lines, Fandiño points out the possibilities of gamification and, in particular, highlights the success of experiences such as Kahoot!

Which educational categories are likely to be further developed in *edutainment*? David del Val talks about the evolution they experienced at Movistar. They found that in terms of education, their users had two types of aspirations: professional improvement and personal development. And within each type they saw that there were degrees of intensity, from the pursuit of mastery by those who felt the need to improve their training, to simple curiosity. Over time they found that the same content could be seen as necessary for some people, while others accessed it out of curiosity. In response to the same question, Fandiño points out the paradox that science and mathematics teachers, who in theory teach drier content, are the ones who make the greatest effort to make it more enjoyable, while those in the arts and humanities are worse communicators.

On the effect that technological innovations, such as artificial intelligence or 5G, will have on *edutainment*, Fandiño distinguishes between the field of production, where they are making it possible to simplify very complex tasks (for example, in the field of animation), and that of users, who are always one step behind. For del Val, one of the most notable phenomena of recent years is the massification of personalisation, that is, the possibility of offering the content that each person demands, and doing so to millions of people. Among the possibilities of technological advances in education, he highlighted the great development of augmented reality and its ability to make education more experiential.

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The two professionals agree on the advantages and disadvantages of digital versus face-to-face. David del Val sums it up in one sentence: "Technology adds, it does not subtract". Yago Fandiño argues that all technologies that help to fix

"Technology adds, it does not subtract".

David del Val

"The teacher will always be necessary, the one who will provide the context and emotional support to the child, but all the tools are beneficial and facilitate their work".

Yago Fandiño

concepts are good: "The teacher will always be necessary, the one who will provide the context and emotional support to the child, but all the tools are beneficial and facilitate their work".

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16 THE IMPORTANCE OF IT AS A BASIC PART OF EDUCATION

One of the biggest advocates of the importance of programming on a global scale is Hadi Partovi, creator of Code.org, a non-governmental organisation founded by the Iranian and his brother Ali in 2012 with the aim of boosting learning in computer science.

In his contribution to enlightED 2021, Partovi began by recounting how computer science, with two gifts from his father (a computer and especially a programming book), provided an escape from the harsh experience of a childhood in post-Islamic revolution Tehran and in the midst of the war against Iraq. Then in the US, as a member of a humble immigrant family, this knowledge enabled him to progress socially: when he was only 15 years old, he already started working in technology companies, and later studied at good universities. As Partovi acknowledges, his is a story of opportunity; however, he suspects that more and more people are questioning the principle that if you work hard you can live better than your parents.

One of the reasons for this is the effect of technology on the workforce, with increased automation of production, and the consequent risk to millions of jobs.

"The reason for teaching computer science is because it makes school better. Better teaching, better preparation for life".

Hadi Partovi

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In view of this situation, Partovi argues for the need for rapid adaptation, on the basis that many schools around the world still do not teach computer science. However, for the founder of Code.org, computer science is not only important as a preparation for the labour market, it is also important for rethinking education as a whole. In his opinion, millions of children are learning in the same way as they did many years ago: new generations of students, schools in new places, but a curriculum that in some respects is 100 years old. Therefore, he believes that we should focus on this century's curriculum if we want to prepare students for life in 2050. Children should not be taught to memorise, they should be taught creativity, problem solving and collaboration. In his own words: "the reason for teaching computer science is because it makes school better. Better teaching, better preparation for life".

Updating the curriculum means that, in the same way that basic subjects such as biology, geometry or electricity were taught, now students should learn how an algorithm works, what artificial intelligence is or the applications of *machine learning*.

Moreover, Partovi argues, computer science offers better preparation for university and employment, regardless of the profession chosen. Data show that students who learn computer science do better in primary school in reading, writing, mathematics and problem solving. In secondary school they perform better in mathematics, and are 17 % more likely to enter university, where they are better at problem solving. And after graduating, they get better salaries. In addition, computers are an excellent tool in the hands of teachers to make their classes more attractive. In this respect, according to surveys, students choose computer science among their favourite subjects, after dance, music and the arts.

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Against the stereotype that computer science is for mathematicians, Partovi points out that students who excel in language skills, or who show facility in languages, are eight times more likely to succeed in computer science than those who excel in mathematical skills.

Partovi provides data on Code.org's success: 64 million students worldwide, 45 % of whom are women, 50 % of whom belong to ethnic groups that are often discriminated against, and 45 % of whom are students with low income. These students have carried out 157 million projects.

The movement started in the US, where all 50 states now have policies to boost computer science from primary to high school, and more than USD 250 million has been allocated for computer science, with 100,000 new teachers. Globally, more than 70 countries have already joined Code.org, with some 2 million teachers. One of the NGO's flagship initiatives, *The hour of code* reached more than 1 billion participants.

According to Partovi, computer science education is at a turning point after the pandemic. And one of the reasons is that the crisis has shown us that education is more flexible than we might have expected. The Code.org founder believes that, in the wake of the coronavirus episode, there are four reasons to teach computer science: the first is that the number of students who now have computers has grown; in the US the percentage is as high as 90 %. In addition, in order to teach remotely, teachers have had to learn digital skills that they did not have before, and in doing so have lost their fear of these tools.

Furthermore, job opportunities have increased, and it is no longer necessary to go to Silicon Valley to get a good IT job. This same conviction was the basis of the talk given by Goodwall's Director General, Taha Bawa, according to whom, the increase in inequality brought about by the pandemic has gone hand in hand with an increase in opportunities at the global level. Goodwall's activity, a platform where people can showcase their skills to access opportunities on a global scale, is a good example of this change.

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Finally, Partovi expressed confidence that improving programming skills is a good way to tackle the increased inequalities that the pandemic may have created.

For Hadi Partovi, there is an idea that needs to be firmly anchored in society: "Computer science is not just for technology jobs, it is a foundational part of basic education. It's not just about programming, it's about creativity and collaboration. They serve to solve global problems. Diseases, climate change, poverty or gender equality".

To address these challenges, the new generations will need to use technology, and they will only be able to do so if we provide them with training: "It's not about job opportunities, it's about helping the human race".

To show the possibilities that learning to programme opens up, Valeria Corrales joined the lecture by Partovi, a young robot programmer and maker, i.e. someone who learns by doing, especially through knowledge shared on the internet and social media. Valeria recounted her experience and encouraged girls to overcome gender biases that keep them away from programming.

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17 SOCIAL SKILLS IN THE FACE OF TECHNOLOGICAL CHALLENGES

Ironically enough, there is a broad consensus on the importance of what are known as soft skills in the era of the digital revolution. When reality seems to be monopolised by technology, essentially human aspects, such as empathy, appear as basic, not only to manage the complexity of the world, but also as a resource for professional development. The psychologist Daniel Goleman, world famous for his theories on emotional intelligence, and the dean of the IE Business School, Lee Newman, talked about this important matter.

The conversation began with an observation: If there is one thing that distinguishes people from machines, it is that machines lack emotional intelligence - an essentially human quality that, as Goleman points out, is based on self-awareness. Indeed, machines have no disposition for optimism or empathy: They cannot know how others feel without being told in words; nor are they able to guide or inspire others to work together towards a common goal.

"Technology skills will help you get a job. But once you have the job, you're competing with people who are just as smart as you, and that's where soft skills make a difference [...] the skills may be soft, but the results are hard".

Daniel Goleman

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Such essentially human qualities must be fundamental in the future. In this sense, Goleman's message to young people who may be sceptical about soft skills is clear: "Technology skills will help you get a job. But once you have the job, you're competing with people who are just as smart as you, and that's where soft skills make a difference [...] the skills may be soft, but the results are hard".

The good news, he argues, is that these skills can be learned. Developing soft skills would be rather like learning a sport, for example golf: you have to constantly practise the *swing*. The same goes for listening. In the cognitive domain, you can learn something all at once; to control your emotions, however, you have to train your brain muscle, like someone who lifts weights repeatedly. Every time you combat a bad habit in the realm of emotional intelligence and replace it with a good one, you are strengthening your emotional intelligence.

But, as Lee Newman points out, following the sporting metaphor, when training in golf you can instantly know where the ball is going: the *feedback* is immediate, whereas in the field of emotional training this feedback is more complicated. Admitting that this is the case, Goleman claims that in many cases the emotional *feedback* can be very obvious, as long as one is willing to pick up on the signals of others. In any case, he believes that a great deal of help can be obtained from a learning partner, a *coach*, someone to help you rehearse behaviours, cope with bad days or manage stress.

Newman and Goleman agree that the key to picking up signals from others lies in self-awareness.
For, as the American psychologist points out, if you are highly self-aware, you are able to see yourself as others see you.

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What is the relationship between emotional intelligence and entrepreneurship? Goleman has a very clear view, supported by research: people with strong emotional intelligence are more successful entrepreneurs. It makes sense, because what entrepreneurs need to do is to be able to manage themselves, to control their pessimistic tendencies. As the author of *Emotional intelligence* comments, perseverance, determination to keep going, is one of the keys to success for any entrepreneur. And then there are the interpersonal relationships: have a good team, inspire it, have others share your purpose, stimulate a sense of belonging to a group or a project, etc.

In his studies on leadership, Goleman refers to a three-pronged approach, three types of concentration necessary for a good leader: self-awareness, for the first task of a leader is to lead himself. The second is to lead others to inspire them, to direct them, to guide them. And the third level of attention is the systems in which we operate, what the competition is doing, how technology is changing, what is happening culturally, socially, economically. For him, a leader must maintain this threefold focus. As Goleman reminds us, one of the mistakes a good leader should not make is to try to control everything. Especially because too much control sends a very negative message to the subordinate: that the leader does not have confidence in their abilities.

Goleman is a strong supporter of the practice of *mindfulness* for managing stress and strengthening the ability to concentrate. According to some studies, regularly repeated mental exercises have a very positive influence on school and work performance, which is why, in their opinion, they should be part of all curricula, of all syllabuses: Research from the University of California shows that students who practice *mindfulness* get better grades and learn better. It also helps them to stay calm in times of stress and to cope with difficulties. Its effect on emotional stress even has a beneficial impact on inflammatory diseases.

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In the run-up to Newman's meeting with Goleman, the enlightED organisation promoted a survey, to which nearly 2 000 people answered. It asked about the small negative behaviours that respondents felt they needed to improve in order to become a better person or a better professional. Among the 22 possible answers, Newman reports, the most voted answer, with 51 %, was "better control my emotions when faced with difficulties or stressful situations". In order to realise this aspiration, Goleman proposes a simple technique, available to anyone, which is taught to members of the US military: Simply inhale for 4 seconds, hold your breath for the same amount of time and exhale for another 4 seconds. According to Goleman, this exercise, repeated 6 to 9 times, is very useful in states of nervous agitation and helps to regain calm.

Newman continues with the results of the survey: the second aspect that respondents would like to strengthen, with 50 % of them, is: "Resist distractions in order to work in a more concentrated way". Goleman refers in this sense to a study that shows that we receive 5 times more information than 20 years ago; and the abundance of information produces a poverty of knowledge. For Goleman, *mindfulness* can also be used to train attention, and especially to regain it after a distraction.

In third place, among the most chosen answers in the survey, there is a tie at 48% between the options "stop procrastinating" and "improve the ability to prioritise tasks". The fourth (40 %) is "better listening", an aspiration that for Goleman has a lot to do with reinforcing empathy and overcoming restlessness. As a simple technique to achieve this, he suggests interrupting the interlocutor as little as possible and, if possible, repeating paraphrasing what the other person has said, asking for their agreement.

Lastly, Lee Newman notes that the fifth most voted response is to overcome the tendency to micromanage, to control behaviour. Again, for Goleman, the best antidote to this bad working practice is empathy: to strive to think about what it feels like to be controlled, to put yourself in the other person's shoes. After all, the controller is basically sending out a humiliating message: that he does not consider the another

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person to be competent. For this psychologist, the most effective leaders set goals, communicate to the people under them what needs to be achieved, and let everyone do things as they see fit.

As a final reflection on the need to develop emotional intelligence in education, Goleman recalls that when senior business executives are asked about the importance of social skills, they always state that they are very important, while younger people do not value them as much. Goleman believes that more attention should be paid to those who base their judgements on many years of work experience.

CREDITS

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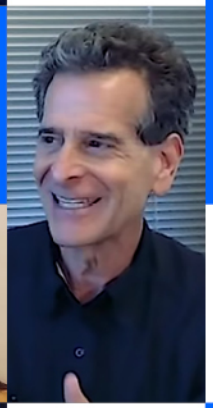

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