

Encuentro Red STEM Latinoamérica
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Check against delivery!

Lecture:

**Cooperation and networking in Latin America to
promote educational innovation in STEAM**

November 9, 2021, 11 am

Keynote:

Dr. Nina Smidt

Education must change

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Greetings

It is my pleasure to greet the vice-minister of Education of Colombia, Ms Constanza Alarcón, Ms Edna Bonilla, Secretary of Education of Bogotá, Ms Alejandra Agudelo, Secretary of Education of Medellín, Mr Ronaldo Roncancio, Rector of Universidad de la Sabana, and our host of the Encuentro Red STEM Latin America, and Ms Natalia García, director of Fundación Siemens Colombia.

A special greeting goes to Paris to Ms Maria Victoria Angulo, Minister of Education of Colombia, and Ms Claudia Uribe, Regional Director of UNESCO Latin America & the Caribbean, who are supporting this important gathering and are currently at the annual UNESCO Conference.

I would also like to send a very warm welcome to all our partner institutions of Red STEM Latin America as well as all present today and connected remotely from many territories of Latin America: a special salute to the teachers and, of course, authorities and institutions of Colombia and all Regions. All being part of the great network: Red STEM Latin America – working together on STEM Education for Sustainable Development and Social Good.

Introduction

Let me start this keynote with a quote from Friedrich Schiller, one of Germany's most respected poets and philosophers – and even though this quotation is from the 18th century it is to me more relevant than ever and sums up perfectly Siemens Stiftung's vision of partnership. The quote reads: "United, even the weak become powerful." To me, this quote is not only relating to the socially deprived, the poor, or the sick. I think we can transfer this quotation to the human species in general, which seems to be sort of weak nowadays related to the problems we are facing as mankind: from climate change to the covid 19 pandemic, political unrest worldwide, digitalization, or globalization. Humanity is going through a dramatic time of change and turmoil.

But before I delve deeper into the topics of this keynote, I would like to address some very personal words to you because this meeting here in Colombia is of particular importance to me. On the one hand, because it is my first visit ever to Colombia, and I am overwhelmed by the great hospitality, the warmth, and the will for change, by the innovative spirit of the Colombians despite sometimes difficult political and social circumstances – or perhaps precisely because of them?

It is also my first trip overseas as Managing Director of Siemens Stiftung, where I have been working for 1.5 years now. Finally, after the turbulent and demanding past months of the pandemic during which I was only able to meet some of you in video conferences, I can now be here to meet many of you in person. Finally, I am getting in touch with the operational work of the Stem Network Latin America. Finally, I get to meet our partners on-site and see how they work hands-on in such different contexts in the Region, especially in Colombia. And at this "Encuentro", not only I, but all of us, have the chance to learn from the experiences of many practitioners. That's why I wanted to participate here in Bogota and that's why I've been looking forward to this visit badly. Thank you for having me here.

Let me introduce Siemens Stiftung just very briefly, not everybody in this enormous audience might be familiar with us. We were founded in 2008 and endowed by the German technology group Siemens AG with a foundation capital of 390 million Euros. We promote as. As a nonprofit foundation, we promote the sustainable development of communities and territories that are crucially dependent on access to Siemens Stiftung's core working areas: basic services, high-quality education, and an understanding of culture. Our international project work supports people in taking the initiative to responsibly address current challenges. The geographical focus of our work is on regions in Africa and Latin America as well as Germany and other European countries. We develop solutions and programs with partners and implement them together.

Siemens Stiftung's deep belief – and underlying our entire methods of operation is the approach of working in partnerships, in co-operations, in networks based on the demands of the various contexts and realities. With Friedrich Schiller's quote in mind: "United, even the weak become powerful." And from here, at the Campus Universidad de la Sabana in Chía, Colombia, I would like to honor what the joint initiative of Siemens Stiftung, Siemens Caring Hands, the German Federal Foreign Office, and, most important, the Red STEM Network Latin America have achieved together in the initiative "STEM Education for Innovation," which is one of many projects, which Siemens Stiftung is actively supporting in Latin America. Let me thank everyone listening who made Red STEM Latin America possible, who gave birth to this fantastic initiative launched at the beginning of this year when the COVID 19 pandemic and its challenges were at its peak. A big thank you to the many partner institutions and the teachers of Red STEM Latin America and their commitment, their expertise, and development capacity. You all joined in and contributed to 14 projects, coordinated by 12 partner institutions across Latin America, in which open education resources and formats were developed into a robust portfolio of blended education resources and formats. Developed in Latin America for Latin America as a solution to the needs of education in most difficult times.

UNESCO estimated that around 160 million students in Latin America were affected by school closures due to the pandemic. A disastrous situation. But the more than 85 partner organizations of the Red STEM Network from 11 Latin American countries – ministries, educational institutions, universities, teachers and many others – shared knowledge and joined forces on this project for teachers and students to develop digital and analogue education materials on STEM subjects such as science, technology, sustainability, climate change, health, and digitalization. There was an urgent need to act. And the Red STEM Network acted!

Everyone worked ad hoc, uncomplicated, cooperative, with an enormous personal commitment to set up these 14 projects, ranging from certifiable courses for teachers to the provision of digital teaching media. Creating learning opportunities tailored to the requirements of this crisis in the shortest possible time and under the most difficult conditions. About 116,000 teachers took part in 7 workshops and webinars and we had 33,000 clicks on the newly built open-learning platform CREA. The initiative "STEM

Education for Innovation” and the Red STEM Network have proven themselves in the crisis and, at the same time, have been able to contribute to the needed paradigm change in the future of education.

Transition

But what exactly can the future of modern education look like? How must future-oriented education systems be designed? What are the essential elements of successful, trendsetting education? In my keynote, I would like to illustrate this in terms of the educational work in Latin America. For me, three main features are essential:

1. Working in networks, as cooperation is a key to achieving collective impact.
2. Education has to change to meet the demands of a VUCA world.
3. Educational innovations such as OER need to be implemented and the curricula have to be adapted.

1. Key message: networks, partnerships

Let’s start with the question, why networks are so important. What is their power?

This first annual meeting of the Latin American Regional STEM Network is a perfect example of the importance of networks: Colombian institutions such as the Ministry of Education, Education secretaries of Bogotá and Medellín, the Universidad de la Sabana and other universities, but also UNESCO and the commitment of local Siemens foundations of Colombia, Argentina, and Brazil, are jointly organizing this event and thus setting an example for networking. Local, regional, national as well as cross-sectoral actors are connected here, where the knowledge of all participants can be expanded.

To me, this is the only way to solve the issues in the VUCA era. In a world of volatility, uncertainty, complexity, and ambiguity – the characteristics of our modern world. We will have to deal with VUCA in all sectors of society and problem-solving approaches need to be reflected in each system – including the educational system.

Networks don’t always need to have an institutional character. The Latin American STEM Network, which we initiated and coordinate, is neither a legal entity nor does it have a complicated hierarchical structure. Instead, it is a loose, highly motivated, and highly cooperative network that - as proven in the pandemic - can act quickly and without barriers. Red STEM Latin America fosters collaboration, capacity-building, and knowledge transfer, combining regional round tables on STEM topics as well as giving impulse to cross sectoral articulation of many actors in territorial frames. These are the STEM Territories, in which partners of the Red STEM network bundle actions for collective impact.

Organizations interested in joining ask us: What do we have to do to become a member? What criteria do we have to fulfil? We say: just join! All it takes is time and will

and a willingness to cooperate, to share what you are good at. These are the rules of this network and its “STEM Education for Innovation Initiative”. Put on the table what you can contribute and what you know the others need. Put it on the table with almost no conditions. The only condition is that the other person is also willing to contribute his or her skills of high quality and competence and make them available to others.

In this spirit, the network has developed in Latin America far beyond countries and is based on trust and transparency and anchored in mutual exchange and action. And real fascination developed amongst those participating in this cooperation, from the Expert teams of the Ministry of Education to university lecturers in Patagonia who have come particularly far in teacher training on the subject of biodiversity.

We, as Siemens Stiftung, want to do everything we can to ensure that everyone learns from each other because exchange creates a huge pool of knowledge and experience. Not only does the access to knowledge explode through networks, the impact multiplies as well. Let’s take this Encuentro again as an example: 85 invited partner organisations and all participants of their network can learn from each other, start dialogues, and might be inspired for action. Taking their findings back home to their networks, to institutions, schools, students. I am impressed by the radiant power that will be sent out from this meeting. Creating collective impact by linking local, national, and international players of the educational system.

That’s why we, as Siemens Stiftung, see one of our main tasks in initiating and coordinating networks. In Latin America, our efforts have already led to the start of 17 STEM Territories from Mexico to Chile, and the next quite natural step for us is to connect the independently acting STEM Territories to build an even bigger Latin American network within the framework of Red STEM Latin America. The local focus of our STEM Territories concept with partners from civil society, the government, academia, and the private sector is leveraged by the connection to other networks. Education innovations that spring from a specific local context can then be shared among other stakeholders and adjusted to fit other situations.

2. Key message: education must change

But why does education need to change?

Well, there are a couple of reasons: For one thing, the complexity of a globalized world with its increasing interdependences should be mentioned. Another is the enormous technological progress like digitality. But education in the digital age cannot mean that children in the mountain regions of Peru, where there is no telecommunications signal, cannot learn because everything is digital. We must learn to use digitality in a context- and needs-oriented way along with very traditional teaching methods like e.g. radio. Education has to provide that. And yet: Solutions for contexts of high, low, and no connectivity must be used more and more in classrooms.

How this can work can be illustrated using a teacher from Chile: María Marcela Vargas Fernández teaches 5 to 6 years-old pupils in Santiago. When the pandemic started, the school was closed, but there was hardly any access to digital equipment for students in her class. She started to organize computers for her students in her community: used, discarded electronics. More and more students could participate in her new but short Zoom classes – since the school couldn't afford the professional Zoom license with unlimited time access. Let me read out to you Mrs. Vargas Fernandez's own description of this situation, where she had to change her teaching overnight due to the new situation the world was facing:

“Every day I go through three modules digitally with the students. Two on topics they should learn at their age and one module on psychomotor exercises. Very often we are together for far longer than the agreed time because the children simply don't want to stop. I also surprised myself. I never thought I would be able to handle digital media and tools the way I do now. Never before have I shot and edited videos, never held lessons and play sessions via Zoom. Let alone combining programs and apps like PowerPoint, Canvas, and more. But it works! I've been learning all the time, trying things out. In the meantime, I have introduced synchronous and asynchronous teaching modules. This means that the children do certain tasks at home together with adults. Then we get together virtually and go over the results with each other.”

Mrs. Vargas Fernandez illustrates a very important change in education besides the use of digitalization in her work. Education will no longer only take place in the classrooms with teachers and students as main participants. In a changed educational landscape, education will also take place outside the classrooms with new actors from real life: parents at home, the village, the community – the children's living environment will be integrated.

But let me quote Mrs. Vargas Fernandez again and her practical experience straight from her work:

"An important improvement from this time is that parents and family finally get to see what their children are actually learning and experiencing when they are in kindergarten. They participate, they observe, and they support. Parents learn to understand topics didactically-pedagogically, they see themselves much more in the co-responsibility and active accompaniment of their children. And more and more parents, if they can find the time, are motivated to participate. It leads to completely new and beautiful teaching and learning experiences."

This approach perfectly fits our view of STEM education. STEM education claims to be solution-oriented and life-improving and therefore goes beyond school. How can you possibly claim to be life-improving when you are in classrooms locked away from real-life situations? To improve this situation, we have to connect school life with life in the families and the territories the children live in. The vivid connection of the triad school-family-territory is essential for future education. Individuals learn and understand at

school, in their living environments, and then apply the new knowledge to improve community life. In this transfer, the family has an important role as a bridge builder.

These new demands for a modern education must also be reflected in the curricula, which must be adapted and changed. We all have to raise questions and start the discussion:

- What is important to learn and how should it be learned?
- How do we integrate new thematic fields, such as climate change education, into the curricula?
- How do we teach future readiness?
- What do students need to understand and decide as active citizens?
- Which competencies must be taught to the children?
 - I am sure everybody is familiar with the term “21st-century skills”. But please let me mention them again because they are so essential. These core competencies such as collaboration, digital literacy, critical thinking, and problem-solving are basic equipment in today's world and will be even more in the years to come. They urgently have to be integrated into the curricula.

Before we move to my last key message, let us briefly touch on the role of universities in this change. Their importance will be elaborated by Rector Rolando Roncancio of the University of Sabana in much more detail in a speech later on. But let me say that in a systemic approach, universities are not only important for the education of teachers and academia, but they are also essential actors for the development of sustainable territories. Their cooperation with communities and a new approach of not acting in an inward-looking way but rather outward looking – taking their share of co-responsibility for social development – can lead to a new definition of the working methods of universities as well as to a new definition of their role in society.

3. Key message: Educational innovations are necessary

Let us travel in my keynote to Jessica Espinoza Fuentes, who is a teacher at Liceo Eugenia Subercaseaux in San Sebastián, Chile. She has been working since the beginning of this year with experts at Pontificia Universidad Católica de Valparaíso and teachers from Colombia, Ecuador, Mexico, and Peru on designing the “Experimento Blended” program, which is part of the STEM Education for Innovation initiative. Her experience with educational innovations, already implemented in daily life, is an example of how future education might look like. For the past year, she’s been teaching 37 primary school students who she has never met in the classroom before experimenting with these new teaching formats.

Recently, she said to her students: “Kids, today we’re going to learn about water and its different forms. We’ve been invited to the Chilean Antarctic Territory by the head of the

base there. It's really cold, much colder than it is in the morning in Sebastián. Everybody needs to dress warmly. Don't forget your hat, scarf, and your winter jacket." One by one, she held these items in front of the computer screen and saw the children do the same. Then she called the head of the Antarctic base, and he joined her teaching on Zoom. He said hello to the children and used his camera to show them the base and the research projects they are conducting. Through the online meeting, he took the children outside in the snow and the ice. He showed them the weathervane, explained where the energy comes from to heat the base, and described how a person needs to behave in Antarctic conditions. He taught the children about the different forms water can take – liquid, steam, ice, and snow – and about water and temperature, all while sharing a little bit about life at the southernmost point in the world.

What a great day of fun this was for the pupils sitting at home in their rooms. What a great enrichment for the students and their learning experience. Blended learning, which connects analogue and digital content, is part of the STEM Education for Innovation Education Initiative, where teachers like Jessica Espinoza Fuentes, university researchers, and education specialists work together on new, combined teaching methods and develop new teaching materials.

Meanwhile, and thanks to the foundation of the Centro de Recursos Educativos Abiertos, or CREA for short, there are now more and more topics, media, and formats to give inspiration for this kind of modern lesson planning. CREA is part of the Red STEM Latinoamérica network and includes an ever-growing collection of free didactic materials. The pandemic triggered the establishment of this independent Open Educational Resources portal for Latin America. As mentioned above, most of our Latin American partners were involved in providing content for this massive network collaboration, ranging from education ministries to universities, local NGOs, and international partners, contributing hundreds of media on STEM subjects and sustainable development. In less than two months, the OER portal went live. And again: What a great network success.

Siemens Stiftung supports the OER movement in Latin America, as an important development towards more educational equity and educational innovation. In my eyes, this aspect of educational equity that is achieved through OER is not to be underestimated. No matter in which country of the world students live in, in a future world with entirely Open Educational Resources educational equity can develop rapidly. Just imagine what a world this could be. Let's work together on getting closer to this vision.

We are very proud to launch the Latin America version CREA now officially at this meeting. 1,300 teaching materials, teaching methods and teacher training for STEM education are online, and more are to come: By the beginning of next year, another 400 open educational resources and training will be available on CREA, which were created as part of the education initiative. And remember! CREA's success story started not even a year ago! Many thanks to everybody who has made this project become reality.

Before I close my keynote please let me point out one final but major aspect that, in the eyes of Siemens Stiftung, has to be transformed as well. The content of education needs to be adapted. STEM education has to be combined with new overriding topics such as digitality, climate change, and sustainable health. For us, these issues are of such significance that we have made them the thematic priorities of Siemens Stiftung.

End

At the end of my speech, let me repeat my key messages again briefly. I hope my words could inspire you a little bit for Siemens Stiftung's passion to bring together people, organisations and actors – to connect them to networks. Since co-operations and partnerships are key factors in solving the complex problems of the future. The educational system must change, and innovations such as OER are necessary for this change.

We have come together at this meeting with the most different backgrounds, from various countries of the world, originating from diverse sectors of society, practicing different professions, and yet we are all here for one common goal: to improve education by cooperating, by networking. Let us exchange visions and ideas, let us declare and commit ourselves to new partnerships in and for the education system since we are connected by the dream of a better and fairer future. By educational equity.

Thank you for listening.