

# INTED **2021**

15th International  
Technology, Education and  
Development Conference

8-9 March, 2021

## CONFERENCE PROCEEDINGS



*Sharing the Passion for Learning*

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15th International Technology, Education and Development Conference  
March 8th-9th, 2021  
Virtual Conference

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## Preface

INTED2021 Conference Proceedings contain selected and revised papers from the 15th International Technology, Education and Development Conference.

INTED2021 was held virtually on March 8th and 9th 2021. Since 2007, this conference has been held annually in-person. However, due to the COVID-19 restrictions, this 2021 edition was held on-line.

Every year, INTED brings together lecturers and researchers from universities and educational institutions from all over the world. This on-line edition counted with 1167 participants from more than 75 different countries, ensuring a geographic diversity and a multicultural atmosphere.

The main objective of INTED2021 was to offer a forum where experts could present and share their works and projects on education, learning and teaching technologies and educational Innovations. The conference platform also provided different networking activities where participants could interact with other delegates and share their perspectives on education. In addition to the Technical Program, different plenary speeches, workshops and discussion sessions were delivered by world-leading inspiring speakers (keynote speeches available at IATED Talks, <https://iated.org/talks/>)

The scope of INTED2021 included the following topics: Learning and Teaching Methodologies, Experiences from face-to-face to Remote Learning, Instructional Design and Curriculum Priorities, , educational projects and innovations, New challenges for the Higher Education Area, Learning Experiences in Primary and Secondary School, Vocational Training, Lifelong Learning, Pre-service teacher experiences, Lifelong Learning, Inclusive Learning, Teaching and Learning innovations, Joint Research projects, Tutoring and Coaching, Evaluation and Assessment of Student Learning, Flipped Learning, Collaborative and Problem-based Learning, Experiences in STEM Education, Next Generation Classroom, Links between Education and Research,, e-Learning, Mobile learning, Blended Learning, Learning Management Systems (LMS), Technology-Enhanced Learning, Augmented Reality, Collaborative Virtual Environments (CVEs), Virtual Learning Environments (VLEs), Web 2.0 and Social Networking, Massive Open Online Courses (MOOC), Educational Software and Serious Games, Quality assurance in Education, University-Industry Collaboration, E-content Management and Development, Inclusion and Equity, Students and Teachers Well-being, Diversity issues and women and minorities in science and technology.

The INTED2021 International Program Committee is composed of lecturers and researchers from all over the world. We wish to thank the program committee members who conducted a blind peer review process to guarantee the quality of the contributions and provided insightful reviews. A meticulous job in selecting papers for publication was conducted. The following points were evaluated: information content, general structure, clarity, relevance, originality, relation to the conference topics and disciplines. The language of the publication was exclusively English.

Moreover, INTED2021 aims to publish conference proceedings that contain original research articles of high-quality meeting the expected ethical standards. IATED shall guarantee the high technical and professional quality of the publications and that good practice and ethical standards are maintained. Authors publishing in INTED2021 signed the IATED copyright transfer form. More information about the publication ethics of IATED is available at: [https://iated.org/publication\\_ethics](https://iated.org/publication_ethics)

Finally, we wish to extend our most sincere thanks to all members and delegates who made this INTED2021 Proceedings possible. Thank you for your commitment and for your contribution to education during these difficult COVID times.

Luis Gómez Chova  
Agustín López Martínez  
Ignacio Candel Torres

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### Organizing Committee

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## Keynote Speakers

### INTED2021 Keynote Speakers

Stephen Downes, *National Research Council of Canada, Canada*

Tracey Tokuhama-Espinosa, *Harvard University's Extension School, United States*

Kiran Sethi, *The Riverside School, India*

Bo Stjerne Thomsen, *LEGO Foundation, Denmark*

Michael Wesch, *Kansas State University, United States*

Rose Luckin, *University College London, United Kingdom*

Craig Kemp, *Educational Consultant, United States*

### Stephen Downes - Digital Technologies Research Centre. National Research Council of Canada (Canada)



#### *Webinar: Your Instant Decentralized Learning Community*

In this hands-on interactive session Stephen Downes will lead participants as they create a distributed online community, thus modeling a practice that can be used for any class or learning group. It is desirable though not mandatory to take part in the activities in this session. Participants will learn how to use their own website or blog to keep connected with the community using content syndication and to connect them with social media sites. Downes will talk about the dynamics of distributed online conversations, demonstrating with examples how these can combine digital learning with individual agency, as well as providing links to people

and resources beyond individual courses and platforms.

**Biography:** Stephen Downes works with the Digital Technologies Research Centre at the National Research Council of Canada specializing in new instructional media and personal learning technology. His degrees are in Philosophy, specializing in epistemology, philosophy of mind, and philosophy of science. He has taught for the University of Alberta, Athabasca University, Grand Prairie Regional College and Assiniboine Community College. His background includes expertise in journalism and media, both as a prominent blogger and as founder of the Moncton Free Press online news cooperative. He is one of the originators of the first Massive Open Online Course, has published frequently about online and networked learning, has authored learning management and content syndication software, and is the author of the widely read e-learning newsletter OLDaily.

### Tracey Tokuhama-Espinosa - Harvard University's Extension School (USA)



#### *Keynote speech: Never a Better Time to Be an Educator! How Leveraging Neuroscience is Great News For Online Teachers*

There is a series of new studies emerging over the past decade that show direct benefits of knowledge about how the brain learns that improve the likelihood of achieving desired educational outcomes in the classroom. Fifteen years ago, it was thought going from the “lab to the classroom” using neuroscientific insight was a pipe dream. Now, the new and emerging fields within the learning sciences, including Mind, Brain, and Education science, have laid out a speedy track for research, application and evaluation which provides enough evidence to share “best practice” concepts with educators.

This keynote will lay out the new “normal” of teacher preparation based on the additional roles of neuroscience and technology, which are particularly important in times of COVID-19.



**Biography:** Tracey teaches a course at Harvard University's Extension School called "The Neuroscience of Learning: An Introduction to the Science of Mind, Brain, Health, and Education," and is Associate Editor of the Nature Partner Journal, Science of Learning. She was a member of the expert committee of the Organization for Economic Cooperation and Development (OECD) to determine teachers' new pedagogical knowledge based on contributions from neuroscience and technology and has written about the brain and learning for UNESCO. Her current work is aimed at turning research from the learning sciences into useable knowledge for teachers at all levels of education; the use of technology to improve student learning; bilingualism and multilingualism; and neuroscience-informed curriculum changes that can improve student success. Tracey has worked extensively with public and private entities to improve the quality of education around the world and currently lives in New York.

### Kiran Sethi - The Riverside School (India)



**Keynote speech: Human by Chance. HumanE by Design**

It is becoming increasingly clear that the needs of the twenty-first century 'learner' demands new approaches to 'learning'. The lack of student voice and agency in their learning has meant that schools around the world still take a largely standardized, "one-size-fits-all" approach, valuing 'compliance' over 'creativity', 'content' over 'character'. This approach doesn't set children up well to thrive in the twenty-first century. Today, student success requires skills for collaboration, creativity, compassion, and problem solving. There is an urgent need to prepare our young people to both navigate an unknown and complex future and believe they have the skills to

shape a more desirable, sustainable future. To meet this need, it is even more imperative that teachers tap into their own creativity and build this same belief in their own capacity to develop and drive change within education. Design thinking is one of the ways we can address this need. It asserts that new and better things are possible and that each of us can make change happen if we cultivate a human-centred, collaborative and optimistic mindset. It is this optimism that is needed in education today, and it is a process that can be consciously nurtured and energized if we want all our children to graduate as Citizen Leaders.

**Biography:** Kiran Sethi is a Designer who became a Teacher, a Principal who grew into an Education Reformer and subsequently morphed into a Social Entrepreneur. A trained Graphic Designer, she comfortably uses the language of Design – iteration, prototype, design specs – to develop not only curriculum innovation, but also community-based Social Programmes. In 2001, she founded The Riverside School in Ahmedabad, India, which is now viewed as a Laboratory to prototype "design processes" that enables "transformative" student learning experiences. Kiran is also the founder of 'aProCh'—an initiative to make our cities more child friendly, for which she was awarded the Ashoka Fellow in 2008. In 2009, she received the "Call to Conscience Award" by the King Centre at Stanford. In 2009, Kiran launched "Design for Change". Today, DFC is the world's largest movement of change - of and by children and is in 60+ countries — impacting over 2.2 million children and 65,000 Teachers.

### Bo Stjerne Thomsen - LEGO Foundation (Denmark)



**Keynote speech: Reimagining Learning with Technologies**

We are at a critical moment in history, with a remarkable opportunity to harness the quality of technologies to reimagine learning, based on the science of how children learn through play. Our current education system has failed to support children's development and learning. This was the case before covid-19 and has only been accelerated by the interruptions to everyday life, education and work. Based on a series of studies, Dr. Bo Stjerne Thomsen will describe the recommendations for educators, parents and policy on how technologies can truly transform our learning environments based on children's joy of learning, to test and try out ideas, and use

their creativity to develop a holistic set of skills, more relevant for a changing and uncertain world.

**Biography:** Dr. Bo Stjerne Thomsen is Vice-President, Chair of Learning Through Play, and member of the Leadership Team at the LEGO Foundation. As Chair and senior expert on how children and adults learn through play, he provides consultation at a bilateral, regional and multilateral level to international partners and leaders. He represents the LEGO Foundation and the LEGO Brand Group at international forums, and advises leadership teams across the LEGO entities, to attain the overall LEGO Brand Vision of becoming a global force for Learning Through Play.

### Michael Wesch - Kansas State University (USA)



**Keynote speech: *How a Reluctant Online Teacher found Joy, Purpose, and Adventure Teaching Online***

Five years ago, a dwindling staff and even smaller budget at our state university left me with no choice but to teach online. I worried about the degradation and ultimate loss of everything I loved about teaching: deep conversation, spontaneous collaborations, and emergent insights just to name a few. But like so many others have experienced over the past year, teaching online in a crisis had the surprising effect of freeing me of traditional "class" expectations, and I started re-thinking everything. Five years later it is my face-to-face classes that often seem lacking compared to their online counterparts, and students agree. In contrast to my in-person classes, my "online" classes are out in the world and freed from the classroom walls. "Assignments" students "have to" do are now challenges they want to do. And I have been freed to travel and create videos all over the world, taking my students with me to show them the real world while also modeling my own discipline and practice of anthropology. In this presentation, I will take you behind the scenes to see how I set up an online course to create a sense of purpose, connection, and adventure for teachers and students alike.

**Biography:** Michael Wesch is Professor of Anthropology and University Distinguished Teaching Scholar at Kansas State University. He is the creator of the Teaching Without Walls video series which includes the top-ranked YouTube video for college online teaching. The New York Times listed him as one of 10 professors in the nation whose courses "mess with old models" and added that "they give students an experience that might change how they think, what they care about or even how they live their lives." His videos have been viewed over 25 million times, translated in over 20 languages, and are frequently featured at international film festivals and major academic conferences worldwide. Wesch has won several major awards for his work, including the US Professor of the Year Award from the Carnegie Foundation, the Wired Magazine Rave Award, and he was named an Emerging Explorer by National Geographic. He is also co-creator of anth101.com and author of *The Art of Being Human*, a free and open textbook alternative for Introduction to Cultural Anthropology. <http://youtube.com/mwesch>

### Rose Luckin - University College London (United Kingdom)



**Keynote speech: *The EDUCATE Golden Triangle: Connecting Key Stakeholders to improve the development and application of educational technology.***

In this talk I will present the EDUCATE programme that was developed to create better connections between the people who design and develop educational technology, the people who use educational technology: teachers, learners, parents etc., and the research community who can help others to understand if an educational technology is effective. From June 2017 to the end of 2019, the EDUCATE programme at UCL worked with more than 250 educational technology businesses to help them understand how better to use their data to understand how well their product or services was meeting the needs of their customers. We also piloted a programme for educators to help them make the best use of the technology available to them and to create and share evidence about the effectiveness of their technology use. The EDUCATE programme will start again in Spring 2021 and I will discuss what

we learnt from the first programme (2017-2019), how we are revising the new programme and the impact that the COVID pandemic has had on the EdTech ecosystem.

**Biography:** Rosemary (Rose) Luckin is Professor of Learner Centred Design at UCL. Her research involves blending theories from the learning sciences and techniques from Artificial Intelligence (AI). Rose is author of 'Machine Learning and Human Intelligence: the future of education in the 21st century' (2018). Rose is also Director of EDUCATE: a London hub for Educational Technology StartUps, researchers and educators to work together on the development of evidence-informed Educational Technology; Specialist Adviser to the UK House of Commons Education Select Committee for their inquiry into the Fourth Industrial Revolution, Co-founder of the Institute for Ethical AI in Education; a member of the UK Office for Students Horizon Scanning panel, an adviser to the Topol review into the future of the NHS workforce; a member of the European AI Alliance, holder of an International Franqui Chair at KU Leuven; one of the 20 most influential people in Education (Seldon List 2017).

### Craig Kemp - Consultant (USA)



#### **Workshop: Surviving to Thriving with EdTech in a Time of Constant Change**

In this session, world-renowned educator and global education keynote speaker and consultant, Craig Kemp will share stories about the current landscape of global education and the need to support learning through digital technologies in a transformational time. Covid has thrown us into a spin and changed the way we teach, learn and grow. Technology holds the power to support us through tough times and into the future to support us in moving from surviving to thriving. Craig will explore how to change mindsets and empower learning through the effective and purposeful integration of

technology, using case studies from his experiences as an educator in New Zealand and Singapore for the past 15 years. This session is suitable for both K-12 and Higher Ed educators and leaders. Come along and be prepared to engage, learn and challenge the way you think about education and learn from the best.

**Biography:** As a well known and respected keynote speaker, workshop host, and global Education Consultant, Craig is a leader in the field of ICT and EdTech and works with Departments, Ministries, School Leadership, School Communities and Educators to understand, design, and implement digital learning solutions and transformations to improve teaching practice and student learning outcomes. Craig has supported schools and organisations all over the globe to establish practices, protocols and guidelines to support the sustainable implementation of technology into the curriculum to add value to student learning. In addition, he works as an advisor with technology vendors adding value to their products for use in schools. Craig works with these companies to help them build, develop, grow and connect with schools all over the world and has successfully supported global EdTech companies in developing a presence in APAC.

## **Conference Tracks & Sessions**

The INTED2021 conference program is available online at <https://iated.org/inted2021>

### **INNOVATIVE EDUCATIONAL TECHNOLOGIES**

Technology Enhanced Learning  
Virtual & Augmented Reality  
Research on Educational Technologies  
Coding & Educational Robots

### **DIGITAL & DISTANCE LEARNING**

Distance Education in COVID-19 Times  
MOOCs & Open Educational Resources  
Blended & Mobile Learning  
e-Learning  
Learning Management Systems & Virtual Learning Environments

### **DIGITAL TRANSFORMATION OF EDUCATION**

Data Science & AI in Education  
Learning Analytics & Educational Data Mining  
Digital Technologies and Resources for Learning under Lockdown  
21st Century Skills  
Educational Programming & Robotics

### **INNOVATIVE EDUCATIONAL TECHNOLOGIES**

Virtual & Augmented Reality  
Technology Enhanced Learning  
Videos and Social Media in Education

### **INCLUSION & MULTICULTURALITY**

Special Educational Needs  
Intercultural Competences & Multicultural Environments  
Diversity Issues  
Digital Divide during Pandemic and Beyond

### **ACTIVE & STUDENT-CENTERED LEARNING**

Gamification & Game-based Learning  
Problem & Project-Based Learning  
Pedagogical Innovations  
Soft Skills Development  
Libraries and Museums as Learning Spaces

## **ASSESSMENT, MENTORING & STUDENT SUPPORT**

Assessment & Evaluation  
Rethinking Assessment in COVID-19 Times  
Mentoring & Tutoring  
Student Engagement & Wellbeing in COVID-19 Times  
Student Support & Motivation

## **EDUCATIONAL STAGES & LIFE-LONG LEARNING**

From Pre-school to Secondary Education  
Vocational Training  
Exchange Programmes & International Experiences  
Transition to the Job Market  
Developing Entrepreneurship in Education  
Life-Long & Workplace Learning

## **QUALITY & IMPACTS OF EDUCATION**

Quality in Education  
Curriculum Design Experiences  
Sustainability & Environmental Awareness  
Social Impact of Education  
University-Industry Collaboration  
Educational Policies & Impact of Education

## **TEACHER TRAINING & ED. MANAGEMENT**

ICT & Digital Skills  
Teacher Training and Support in COVID-19 Times  
Professional Development of Teachers  
Educational Management

## **STEM EDUCATION**

Maths & Statistics  
Engineering Education  
STEM Experiences

## **LANGUAGE LEARNING AND TEACHING**

Foreign Languages  
Teaching Foreign Languages during the Lockdown  
Technology for Language Learning  
Language Learning

## **DISCIPLINE-ORIENTED SESSIONS**

Architecture & Civil Engineering Education  
Health Sciences Education  
Computer Science  
Business and Management Education