

EDULEARN²²

**14TH INTERNATIONAL CONFERENCE
ON EDUCATION AND NEW LEARNING
TECHNOLOGIES**

**PALMA (SPAIN)
4TH-6TH OF JULY, 2022**



CONFERENCE PROCEEDINGS



EDULEARN₂₂

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Preface

EDULEARN22 Conference Proceedings contain selected and revised papers from the 14th annual International Conference on Education and New Learning Technologies.

EDULEARN22 was held in Palma (Spain) last 4-6 July 2022. Every year, EDULEARN brings together lecturers and researchers from universities and educational institutions from all over the world. This edition welcomed participants from 79 different countries, ensuring a geographic diversity and a multicultural environment.

The main objective of EDULEARN22 was to offer a meeting point for educational experts to share and discuss their experiences and projects on education, pedagogical technologies, and educational innovations. The conference program offered different keynote speeches, plenary sessions, parallel thematic sessions and workshops delivered by education experts. The keynote speeches are available at IATED Talks (iated.org/talks/)

In addition to the Technical Program, different networking activities and events were scheduled where participants could interact with other delegates and shared their perspectives on education.

The scope of EDULEARN22 included the following topics: Digital Tools In Education, Digital literacy, Open Educational Resources, Virtual and Augmented Reality, Flipped learning, e-learning experiences, Blended and Hybrid learning, m-learning, digital transformation in education, Game-based learning, MOOCs, Coding and Computational Thinking, Digital Technologies for learning under lockdown, Personalized and Adaptive learning, Peer and Team-based learning, Student Engagement, University-Industry cooperation, International Projects, Exchange and Mobility Programs, Entrepreneurship Education, Student support and Wellbeing, STEM education, Diversity and Equity in education, Special and Inclusive experiences, Tutoring and Mentoring, Curriculum design, Quality assurance, Active and Experiential learning, Professional Development of Teachers, Pre-Service Teacher experiences, Vocational Education, Digital Competence of Teachers.

The EDULEARN22 Proceedings include the accepted contributions presented at EDULEARN22 Conference. The EDULEARN22 International Program Committee is composed of lecturers and researchers from all over the world. A meticulous job in selecting papers for publication was conducted. We wish to thank the program committee members who conducted a blind peer review process to guarantee the quality of the contributions and presentations. The following points were evaluated: information content, relevance to the field, general structure, clarity of contents, originality, relation to the conference topics and disciplines. The language of the publication was exclusively English.

Moreover, EDULEARN22 aims to publish conference proceedings that contain high-quality original research articles, meeting the expected ethical standards. Authors publishing in EDULEARN22 Proceedings signed the IATED copyright transfer form. IATED guarantees the high technical and professional quality of the publications, and that good practices and ethical standards are maintained. More information about the publication ethics of IATED is available at: https://iated.org/publication_ethics

Finally, we wish to extend our most sincere thanks to all members and delegates who have contributed to EDULEARN22 Proceedings. We also wish to express our gratitude to all participants and attendees for their engagement, motivation and passion for education.

Luis Gómez Chova
Agustín López Martínez
Joanna Lees

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Organizing Committee

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Stephen Heppell – *Universidad Camilo José Cela, Spain*

Wayne Holmes – *University College London, United Kingdom*



Wayne Holmes, University College London (United Kingdom)

Workshop: The right type of AI in Education

Current AI in education approaches tend to be solutions- rather than problems-oriented. In this workshop, we're going to take steps to address this, focusing on identifying genuine education problems that the application of AI might help address. Throughout, we will take a critical and human rights perspective, and will ensure a voice for all.



Michelle R. Weise, National University System (United States)

Workshop: Jumping to your next S-curve

In this futures-oriented workshop, Dr. Michelle R. Weise will facilitate small group breakout sessions in which you will each have an opportunity to think through your current business or organizational model as well as your value proposition for the working learners of today and tomorrow.



Stephen Heppell, Universidad Camilo Jose Cela (Spain)

Workshop: The aggregation of marginal learning gains: making your learning space so very much better

The workshop explores the many environmental details covered in Stephen's keynote and seeks simple, cost effective, proven, try-today, solutions to optimising your learning space. If we want to be our best learning selves, then how might we start today?



Desiree Cranfield, Swansea University (United Kingdom)

Workshop: Knowledge Sharing café – teaching innovation before, during and after Covid-19

The aim of this session is to provide an opportunity for attendees, academics, to come together, in an informal setting to informally share teaching experiences, both good and bad, with the aim to inform practice.

The impact of this session can be the building of networks, the immediate sharing of teaching best practice of a time before, during, and after the pandemic, improving the knowledge around teaching practice during this difficult period.



Julie Smith, Webster University in St Louis, Missouri (United States)

Workshop: Media Literacies: The 21st Century Survival Skills that can Change the World

People around the world are spending – on average – eight hours a day with electronic mass media. Yet even in 2022, we are still not talking enough about how this affects people personally, politically, physically, emotionally and educationally. Using theoretical frameworks to provide context as well as classroom experiences to provide relevance, Smith will explain the importance of media literacy skills, how to teach them and the difference they can make in the lives of citizens and students.



Reed Stevens, Northwestern University (United States)

Workshop: FUSE Studios: A Choice and Interest Centered Learning Environment

In this one-hour session, the FUSE team, led by creator Reed Stevens, will seek to bring the audience inside the FUSE experience in two ways over the first 25 minutes: (1) We will provide a tour of the design principles and core activities of a FUSE Studio. (2) We will share vivid representations of youth and teacher-facilitator experiences in FUSE, drawn from a half decade of video-based ethnographic fieldwork and extended interviews with students. In the second 25 minutes, we will seek to bring the audience further inside the FUSE experience via trying one or more FUSE challenges.



Maria Luisa Spreafico, Politecnico di Torino (Italy)

Paola Morando, Università degli studi di Milano (Italy)

Workshop: Not only math: a game-based learning experience for a new teaching approach

In this workshop we present three didactic games in two versions each: math and art, math and science and math and English. Participants will experience the activities live during the workshop. Since we only use everyday materials, like paper and recycled items, teachers can easily replicate the games in their own classes.



Hesham Elmarsafawy, Gulf University (Bahrain)

Workshop: Science Fiction Drama for Continuous Development in Higher Education

The Workshop aims to introduce innovative pedagogy and outline the mechanism of utilizing science fiction drama in the educational processes as alternative tool for Brain warm-up, support the understanding of science matters, forming futuristic view, foster creativity and enhance students' learning abilities and engagement.

EDULERN22 Keynote Speakers

Keynote Speakers

Michelle R. Weise – National University System, United States

Stephen Heppell – Universidad Camilo Jose Cela, Spain

Wayne Holmes – University College London, United Kingdom

Michelle R. Weise – National University System (United States)



Keynote speech: Long Life Learning: Preparing for Jobs that Don't Even Exist Yet

Tech is advancing; jobs are morphing, and job tenure is shorter; retirement is delayed or gone entirely; and education has to be continuous. Education and workforce strategist Dr. Michelle R. Weise talks about the infrastructure we need to build for a future filled with 20, 30, or more job changes. From wraparound supports for workers to targeted education, integrated earning and learning, and transparent and fairer hiring, Dr. Weise will discuss the research from her latest book and how we prepare talent for jobs that don't even exist yet.

Biography: Dr. Michelle R. Weise (pronounced W-ice) is the Vice Chancellor of Strategy and Innovation at National University System. She is also the author of *Long-Life Learning: Preparing for Jobs that Don't Even Exist Yet* (Wiley, 2021). Her book was awarded the 2021 Phillip E. Frandson Award for Literature by UPCEA (University Professional and Continuing Education Association), recognizing the author and publisher of an outstanding work of continuing higher education literature. Thinkers50 named her one of 30 management and leadership thinkers in the world to watch in 2021. Dr. Weise's work over the last decade has concentrated on preparing working-age adults for the jobs of today and tomorrow. She has served as a senior advisor at Imaginable Futures, a venture of The Omidyar Group. She was also the chief innovation officer of Strada Education Network as well as of Southern New Hampshire University. With Clayton Christensen, she coauthored *Hire Education: Mastery, Modularization, and the Workforce Revolution* (2014) while leading the higher education practice at Christensen's Institute for Disruptive Innovation. Dr. Weise also advises BrightHive, a data collaboration platform, the Virginia Economic Development Partnership, the Institute for Higher Education Policy (IHEP), the SkillUp Coalition, Basta, Hitch, Bayes Impact, Clayton Christensen Institute Social Capital R&D Project, and World Education's Personal and Workplace Success Skills Library. She has also served as a commissioner for Massachusetts Governor Baker's Commission on Digital Innovation and Lifelong Learning, Harvard University's Task Force on Skills and Employability, and the American Academy of Arts and Sciences' Commission on the Future of Undergraduate Education. Her commentaries on redesigning higher education and developing more innovative workforce and talent pipeline strategies have been featured in *The Economist*, *The Wall Street Journal*, *The New York Times*, *Harvard Business Review* and on *PBSNewshour*. Michelle is a former Fulbright Scholar and graduate of Harvard and Stanford.

Stephen Heppell – Universidad Camilo Jose Cela (Spain)



Keynote speech: The aggregation of marginal learning gains: why they matter so much for the future of Learning

Learners are facing unprecedented choices - not only of nomadic campuses, hybrid systems and remarkable new technologies, but also of the many details, from light brightness to levels of volatile organic compounds in their learning places, and even diet. These combine to have a substantial impact on our learning, but if we neglect them, then today's learners will seek better places for their learning, elsewhere. This keynote also explores where those better places might be.

Biography: Professor Stephen Heppell has been a professor since the 1980s, he has an unrivalled track record of success and a string of huge projects in both Learning and Technology. He is credited with being the person who put the C into ICT. His support for better Learning is sought by everyone from governments and major corporations, through schools and universities, to elite sports – lately England Rugby, and Team GB’s elite Olympic coaches. Everyone needs better learning. He currently holds the Felipe Segovia Chair of Learning Innovation at Universidad Camilo Jose Cela in Madrid. Additionally, he is Emeritus Professor and Chair of New Learning Environments at Anglia Ruskin University. A pioneer of multimedia and CD-ROM before the Internet, post-internet Professor Heppell created and led what was the Guinness Book of Record’s largest internet learning project, years before Google, Facebook et al. He has been, and continues to be, at the heart of many world leading projects since. Professor Heppell’s learning space design work extends beyond the digital and virtual. Pioneering learning space designs include the UK “Classrooms of Tomorrow” project, much work in the UK Building Schools for the Future initiative, and today school and university building projects ranging from Peru to Spain, from Australia to SE Asia, from Syrian refugees to some of the wealthiest learning institutions in the world. Pivotal research including the learnometer project analysing the light, temperatures, CO2 and more that contribute to better learning and working spaces, have led to Stephen being in considerable demand to transform physical learning spaces in education, but also everywhere from new media to the Australian mining industries.

Wayne Holmes – University College London (United Kingdom)



Keynote speech: Artificial Intelligence and Education. A Critical Studies Perspective

Artificial Intelligence (AI) is frequently hailed as a ‘solution’ to many of education’s core problems (e.g., OECD, 2021) – problems such as the lack of qualified teachers, student underachievement, and better preparing learners for workplaces and career paths that may be very different from current paradigms. However, such claims tend to be aspirational rather than evidence-based (Miao & Holmes, 2021), and overly-simplistic, forgetting issues such as agency, pedagogy, surveillance, efficacy, and ethics (Holmes et al., 2021; Holmes et al., in press; Holmes & Porayska-Pomsta, in press; Porayska-Pomsta, Holmes and Nemorin, in press). Current approaches tend to be solutions- rather than problems-oriented, and all too often replace teacher functions rather than empower teachers, while the teaching of AI almost always focuses on the technological dimension of AI to the exclusion of the human dimension. Accordingly, this presentation will explore teaching with and about AI, from a critical studies and human rights perspective. It will identify and address many of the key myths, and will pose more questions about AI and the futures of learning than it answers.

Biography: Wayne Holmes (PhD, University of Oxford) is a learning sciences and innovation researcher who teaches at University College London and is a researcher on Artificial Intelligence (AI) and education for UNESCO, IRCAI (the International Research Centre for Artificial Intelligence under the auspices of UNESCO), and the Council of Europe. Having been involved in education throughout his life, Wayne brings a critical studies perspective to the connections between AI and education, and their ethical and social implications. His recent publications include “The Ethics of AI in Education: Practices, Challenges and Debates” (in press), “Artificial Intelligence and Education, through the Lens of Human Rights, Democracy and the Rule of Law” (in press), “Artificial Intelligence in Education. Promise and Implications for Teaching and Learning.” (2019), “Ethics of AI in Education: Towards a Community-Wide Framework.” (2021), and, for UNESCO, “AI and Education: Guidance for Policy-makers.” (2021). Wayne also co-authored the EU’s DigComp 2.2 Annex “Citizens Interacting with AI Systems” (2022), and has given invited talks on AI and education in Brazil, China, Croatia, Denmark, Germany, Greece, India, Japan, Oman, Slovenia, Spain, and the US (and online to audiences in many other countries around the world).

Conference Tracks & Sessions

The EDULEARN22 conference program is available online at <https://iated.org/edulearn22>

ORAL SESSIONS MONDAY

Digital Literacy
Next Generation Classroom
Student Engagement
University-Industry Collaboration
International Cooperation
Language Learning and Teaching
STEM Education during COVID-19
Media Literacy, Cybersecurity and Data Privacy
Flipped Learning
Peer and Team-Based Learning
Entrepreneurship Education
Exchange and Mobility Programmes
Language Learning Technologies
Architecture & Civil Engineering Education
Metaverse and Virtual Reality Environments
MOOCs & Open Educational Resources
Personalized and Adaptive Learning
Life-long & Workplace Learning
Educational Management
Pedagogical Innovations in Engineering Education
Digital Tools in Maths Education
Virtual & Augmented Reality
Blended & Hybrid Learning
Tutoring and Mentoring
Education for Sustainability
Student Support and Wellbeing
Experiences in Engineering Education
Maths in Higher Education

POSTER SESSIONS MONDAY

Emerging Technologies in Education
New Experiences in Education

ORAL SESSIONS TUESDAY

Digital Transformation of Education
Data Science & AI in Education
Student Support during COVID-19
From Face-to-Face to Remote Learning (1)
Diversity and Equity in Education
Health Literacy and Patient Education
Mathematics in Primary & Secondary Education
e-Learning Experiences
Work-based Learning
Assessment of Student Learning (1)
Early and Primary Education
Social Inclusion and Academic Success of Chinese Students in EU Higher Education
Experiences in Health Sciences Education
STEM Education Experiences

m-Learning
Active & Experiential Learning
Assessment of Student Learning (2)
From Face-to-Face to Remote Learning (2)
Digital Divide and Educational Inequalities
Special and Inclusive Education
Curriculum Design & Quality Assurance
Digital Technologies for Learning under Lockdown
Game-based Learning
Computer Science and Programming in Higher Education
From Face-to-Face to Remote Learning (3)
Teaching Experiences and Support during COVID-19
Business Education Experiences
Professional Development of Teachers
21st Century Skills
Digital Competences of Teachers
Coding & Computational Thinking
Emergency Remote Teaching during COVID-19
Student Wellbeing in Social Media and Online Learning
Vocational Education
Pre-service Teacher Experiences

POSTER SESSIONS TUESDAY

From face-to-face to Remote Learning
New Trends in Education and Research

VIRTUAL SESSIONS

DIGITAL TRANSFORMATION OF EDUCATION

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

DIGITAL & DISTANCE LEARNING

Distance Education in COVID-19 Times
Challenges and Practices during the Pandemic and Beyond
Blended & Mobile Learning
MOOCs & Open Educational Resources
Learning Management Systems & Virtual Learning Environments

INNOVATIVE EDUCATIONAL TECHNOLOGIES

AI, Chatbots & Robots
Virtual & Augmented Reality
Social Media in Education
Technology Enhanced Learning

TEACHER TRAINING & ED. MANAGEMENT

ICT & Digital Skills
Professional Development of Teachers
Educational Management

ACTIVE & STUDENT-CENTERED LEARNING

Gamification & Game-based Learning
Experiential Learning
Problem & Project-Based Learning
Soft Skills Development
Pedagogical Innovations

ASSESSMENT, MENTORING & STUDENT SUPPORT

Assessment & Evaluation
Rethinking Assessment in COVID-19 Times
Feedback for Learning
Tutoring & Coaching
Student Support & Motivation

EDUCATIONAL STAGES & LIFE-LONG LEARNING

From Pre-school to Secondary Education
Non-Formal and Informal Learning
Transition to the Job Market
Developing Entrepreneurship in Education
Life-Long & Workplace Learning

QUALITY & IMPACT OF EDUCATION

Quality in Education
Experiences and Challenges in Curriculum Design
Sustainability & Social Impact of Education
Links between Education and Research
University-Industry Collaboration
Mobility & International Projects

MULTICULTURALITY & INCLUSION

Multicultural Education
Diversity Issues
Special Educational Needs
Inclusive Education

STEM EDUCATION

Mathematics & Statistics
Engineering Education
STEM Experiences

LANGUAGE LEARNING AND TEACHING

Foreign Languages
Language Learning & Translation Studies
Teaching Foreign Languages during the Lockdown

DISCIPLINE-ORIENTED SESSIONS

Architecture & Interior Design Education
Health Sciences Education
Computer Science Education
Business & Tourism Education