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Editors

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**CONGRESO INTERNACIONAL SOBRE
EDUCACIÓN Y TECNOLOGÍA EN CIENCIAS**

Universidad Católica Santo Toribio de Mogrovejo,
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Preface

In a world that is increasingly shaped by science and technology, the need for multi-literate citizenry and workforce for the 21st century has never been greater [1]. The advent of new and emerging technologies has highlighted the need to equip students with the knowledge and skills set necessary they'll need to succeed in a post-pandemic world with a growing emphasis on STEAM (Science, Technology, Engineering, the Arts and Math) [2]. STEAM is an educational discipline that ties all the subjects to each other in an interdisciplinary way as well as to the full spectrum of the rapidly changing global world we live in. Experts and scholars agree that science, technology, engineering, arts, and math will drive new innovations across different disciplines, institutional contexts, and regions [3]. STEAM education includes grades from pre-school to post-doctoral levels and from formal (e.g., classrooms), informal (e.g., afterschool programmes), and non-formal (e.g., vocational education), open (e.g., MOOCs) and distance education (e.g. Web-based courses) [4], [5].

To be prepared for the demands of modern societies, all learners must have an equitable access to STEAM knowledge and skills [6]. STEAM education has been recognized as an important educational reform to prepare students for the twenty-first century incorporating a unique perspective offered by linking critical thinking, collaboration, innovation, creativity, and productivity [7], [8]. It is an opportunity for scholars and students to collaboratively understand how people learn with modern technology.

This need has led to a paradigm shift from traditional educational philosophy towards innovative and progressive methods of teaching to create more personalized learning experiences, to inspire learning, and to prevent any possible future skills gap. Emerging technologies (i.e., educational technology, information technology, nanotechnology, biotechnology, cognitive science, robotics, and artificial intelligence) are reshaping the educational landscape [6]. They need to adapt to the inevitable impacts in teaching and learning, leading to their reconceptualization following the principles underlying the interdisciplinary STEAM approach; through the design of interactive, collaborative, and inquiry-based learning environments [9].

Educational research literature indicates that successful integration of technology in STEAM education, requires reconstruction of curricula and methods of teaching, learning, and assessment to more closely align with the affordances of new technologies and with STEAM pedagogy [1], [7]. STEAM education should exploit the capabilities and possibilities of modern technologies to create high quality learning experiences that foster students' innovation, creativity, communication and collaboration, critical thinking, and problem-solving skills.

For the edition of this Conference Proceedings, the focus is on the interdisciplinary approach to learning and skills development that transcends throughout cognitive fields and focuses on addressing authentic, real-world problems by means of the complex use of technological tools.

In terms to exploit the capabilities and possibilities of new and emerging technologies, there is a necessity for scholarly publications investigating these technologies' infiltration into STEAM as well as international best practices in the design, development, and educational use of new and emerging technologies in support of learners' STEAM learning processes and outcomes.

CISETC 2021 welcomes relevant contributions from research scholars in authentic contexts. This is an ambitious effort to discuss the challenges surrounding the implementation of modern technologies into the learning process taking in consideration the strengths and limitations of STEAM approaches.

The studies and research that appear in this volume are aimed at the development of computational thinking; and, at broadening student and teacher participation, taking the inclusion of all without distinction of race, sex, or socioeconomic position [10]. This edition presents new initiatives, to ensure theoretical and practical contributions to science education research overall and achievement gaps in both STEAM and non-STEAM fields. Besides, CISETC 2021 shows a series of practical implications which directly affect groups such as teachers, students, researchers, policymakers, education, and training Institutions. This knowledge has been collated in this volume intended to provide guidance to international and national actors on the potential role of STEAM education to provoke thought among practitioners and academics to understand their implications and maximize the potential opportunities, to encourage critical assessments, and to provide pedagogical tools to underpin STEAM's transdisciplinary.

December 2021

The editors.

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Contents

Modification of Scientific Skills through a Robotics Ecology Program <i>Jhon Holguin-Alvarez, Juana Cruz-Montero, Jenny Ruiz-Salazar & Fernando Ledesma-Pérez</i>	10
Development and Validation of a Gamified Videogame for Math Learning in Attention Deficit Hyperactivity Disorder Children (ADHD) <i>Rodrigo Castro, Deyby Huamanchahua</i>	17
Self-Perception of Digital Competences Among Peruvian Teachers <i>Ambrosio Tomás-Rojas, Úrsula Freundt-Thurne, Eliana Gallardo-Echenique & Jorge Bossio</i>	26
Process Mining Model to Guarantee the Privacy of Personal Data in the Healthcare Sector <i>Sebastian Saavedra, José Llatas & Jimmy Armas-Aguirre</i>	34
Predictive Model for Assigning Exercises to Students in Spreadsheet Functions Using Artificial Neural Networks <i>Edwar Saire-Peralta</i>	44
Levels of Information Literacy and its Influence in Reciprocal Teaching in Communication Sciences Students <i>Guillermo Ocrospoma, Doris Fuster-Guillen, Yolvi Ocaña & Klinge Villalba-Condori</i>	53
Use and Design of Virtual and Remote Free Access Experiments: World Pendulum Alliance and DLab in Times of COVID 19 <i>Freddy Torres-Payoma, Manuel Escobar, Leyton Castro, Karla Triana & Diana Herrera</i>	61
Vocational Preferences Towards STEM Degrees in High School Students in Peru <i>Iván Montes-Iturrizaga, Eduardo Franco-Chalco & Klinge Orlando Villalba-Condori</i>	69
Raising Awareness in the Adoption of COVID-19 Preventive Measures in Higher Education Students Through an Epidemiological Surveillance Mobile App <i>Jessie Bravo, María Arangurí, Roger Alarcón & Fiorella Li</i>	77
Real-time Identification of the Emotional State in The Classroom to Improve the Teaching-learning Process <i>Edward Flores, José Livia, Alfredo García & María Dávila</i>	86

Design and Implementation of an Integrated Academic Management Model with LMS: A Peruvian Private University Study Case	94
<i>Emma Margarita Wong-Fajardo, Hugo Saavedra-Sánchez, Mery Mendoza-Rodas & Ronald Hernández-Vásquez</i>	
Design and Implementation of a Virtual Laboratory for Electromagnetics Teaching in Engineering	105
<i>Nereyda Castro-Gutiérrez, Jesús Flores-Cruz & Fermín Acosta-Magallanes</i>	
Cloud Application for the Generation of Static Websites Through the Recognition of Wireframes using Artificial Intelligence	114
<i>Cesar Gutierrez, Rodrigo Lara & Daniel Subauste</i>	
Logical Positivism and its Contributions to Science Teachers Education	123
<i>Marco Aurélio Clemente Gonçalves & Agustin Adúriz-Bravo</i>	
Sentiment Analysis in the Feedback of Peer Evaluation Activities	127
<i>René Elizalde-Solano, Ma. Carmen Cabrera-Loayza, Elizabeth Cadme & Nelson Piedra</i>	
Teaching Experience on the Impacts of COVID-19: Opportunities to Update the Teaching and Learning Process of Bioethics and Scientific Integrity in Human Medicine in Peru.	136
<i>Agueda Muñoz del Carpio Toia, Klinge Villalba-Condori, Cristian Díaz-Vélez</i>	
Virtual Platforms under University Teaching During the COVID-19 Pandemic in Peru: Perception of University Students	146
<i>Agueda Muñoz del Carpio Toia, Oliverio Pichardo-Diestra, Klinge Villalba-Condori & Sively Mercado-Mamani</i>	