Empowering Engineering Education: Breaking barriers through research and innovation

MONDAY, March 11, 2024

08:00AM - 6:00PM

IN PERSON Registration

08:00AM - 9:00AM

Track 1

IN PERSON oral presentations and online livestream on zoom Track 1

Session Manager: Galileo Staff.

HYBRID Opening Session

Chair: Claudio R. Brito

Albania 03:00PM	Argentina 11:00AM	Australia 12 Mar, 12:00AM	Bolivia 10:00AM	Brazil 11:00AM
Canada 07:00AM	Chile 11:00AM	China 10:00PM	Colombia 09:00AM	Ecuador 09:00AM
Germany 03:00PM	Greece 04:00PM	Honduras 08:00AM	India 07:30PM	Indonesia 09:00PM
Ireland 02:00PM	Israel 04:00PM	Japan 11:00PM	Macao 10:00PM	Mexico 08:00AM
New Zealand 12 Mar, 03:00AM	Peru 09:00AM	Philippines 10:00PM	Poland 03:00PM	Portugal 02:00PM
Puerto_Rico 10:00AM	Senegal 02:00PM	Spain 03:00PM	Tunisia 03:00PM	United Kingdom 02:00PM
USA (CDT) 10:00AM	USA (PDT) 08:00AM	USA (EDT) 11:00AM		

Local Time	Presentation
08:00AM	**Speakers:** **Claudio R. Brito (General Chair)** **Roberto Portillo (Conference Chair)** **Summary:** *Welcome ceremony and start of the VIII World Engineering Education Conference (EDUNINE2024) in the city of Guatemala and online around the world.*

09:00AM - 10:30AM

Track 1

IN PERSON oral presentations and online livestream on zoom Track 1

Session Manager: Galileo Staff.

HYBRID English Plenary Session #1

Chair: Claudio R. Brito

Plenary I: Empowering Engineering Education: Breaking barriers through research and innovation (Paper # 837)

Albania 04:00PM	Argentina 12:00PM	Australia 12 Mar, 01:00AM	Bolivia 11:00AM	Brazil 12:00PM
Canada 08:00AM	Chile 12:00PM	China 11:00PM	Colombia 10:00AM	Ecuador 10:00AM
Germany 04:00PM	Greece 05:00PM	Honduras 09:00AM	India 08:30PM	Indonesia 10:00PM
Ireland 03:00PM	Israel 05:00PM	Japan 12 Mar, 12:00AM	Macao 11:00PM	Mexico 09:00AM
New Zealand 12 Mar, 04:00AM	Peru 10:00AM	Philippines 11:00PM	Poland 04:00PM	Portugal 03:00PM
Puerto_Rico 11:00AM	Senegal 03:00PM	Spain 04:00PM	Tunisia 04:00PM	United Kingdom 03:00PM
USA (CDT) 11:00AM	USA (PDT) 09:00AM	USA (EDT) 12:00PM		

Local Time	Presentation
09:00AM	**Speaker:** **Melany M. Ciampi**

Empowering Engineering Education: Breaking barriers through research and innovation

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Authors: Claudio R. Brito, Melany M. Ciampi, Osvaldo Clua, Maria Feldgen

Abstract: *An engineer is a professional who applies scientific and mathematical principles to develop projects and maintain systems, structures, and processes in various sectors. Engineers can specialize and work in different areas, such as electrical, civil, mechanical, aerospace engineering, and many others. They must conceptualize, plan, and execute projects, ensuring they meet safety standards and regulatory requirements, as well as being economically viable. In a connected world, engineering education has a new need: how to educate future engineers to face the challenging technological environment that is increasing the speed of rockets. New ways of teaching for new ways of learning and studying. In this edition of EDUNINE2024, the discussions are around empowering engineering education taking into account these aspects of engineering education and technology development for the good of humanity.*

Resume: ***Melany M. Ciampi:***

Dr. Melany M. Ciampi is PhD, Dr. rer. nat. habil., Eta-Kappa-Nu and Professor of Electrical and Computer Engineering. She was the EDUNINE2022 Conference Chair and Co- Chair of EDUNINE2017, 2018, 2019, 2020, 2021, 2023 and 2024. She is the Rector of the International Institute of Education (IIE), President of the World Organization on System Engineering and Information Technology (WCSEIT), President of the Safety Health and Environment Research Organization (SHERO), President of the World Organization on Communication and Arts (WCCA) and Vice- President on Science and Education Research Organization (COPEC) and Board Member of several Councils and Organizations. In the IEEE Education Society, she was Board of Governors Member for three terms, Secretary for three terms and Vice President for Conferences and Workshops. She is also Chair of the Intersociety Cooperation Committee since 2011 and a member of the Strategic Planning Committee since 2009. She was also Vice-President of IGIP (Internationale Gesellschaft für Ingenieurpädagogik) on 2011-2014 She received numerous honors due to his services to Scientific Commonwealth and Technological Cooperation as the IEEE Edwin C. Jones Jr. Meritorious Service Award 2011 and Ronald J. Schmitz Outstanding Service Award 2016. She has over three hundred published articles in several conferences and journals.

The presentation and Q&A will last 90 minutes.

10:30AM - 11:00AM

Track 4

Hybrid interaction livestream on zoom Track 4

Session Manager:

IN PERSON Coffee Break - VIRTUAL Coffee Break

Track_4

Albania 05:30PM	Argentina 01:30PM	Australia 12 Mar, 02:30AM	Bolivia 12:30PM	Brazil 01:30PM
Canada 09:30AM	Chile 01:30PM	China 12 Mar, 12:30AM	Colombia 11:30AM	Ecuador 11:30AM
Germany 05:30PM	Greece 06:30PM	Honduras 10:30AM	India 10:00PM	Indonesia 11:30PM
Ireland 04:30PM	Israel 06:30PM	Japan 12 Mar, 01:30AM	Macao 12 Mar, 12:30AM	Mexico 10:30AM
New Zealand 12 Mar, 05:30AM	Peru 11:30AM	Philippines 12 Mar, 12:30AM	Poland 05:30PM	Portugal 04:30PM
Puerto_Rico 12:30PM	Senegal 04:30PM	Spain 05:30PM	Tunisia 05:30PM	United Kingdom 04:30PM
USA (CDT) 12:30PM	USA (PDT) 10:30AM	USA (EDT) 01:30PM		

Empowering Engineering Education: Breaking barriers through research and innovation

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11:00AM - 12:30PM

Track 1

ONLINE oral presentations livestream on zoom Track 1

Session Manager: Galileo Staff.

ONLINE English Plenary Session #2

Chair: Agatha Clarice da Silva Ovando

Plenary II: Modernizing collaborative digital education in emerging regions with active learning methodologies (Paper # 916)

Albania 06:00PM	Argentina 02:00PM	Australia 12 Mar, 03:00AM	Bolivia 01:00PM	Brazil 02:00PM
Canada 10:00AM	Chile 02:00PM	China 12 Mar, 01:00AM	Colombia 12:00PM	Ecuador 12:00PM
Germany 06:00PM	Greece 07:00PM	Honduras 11:00AM	India 10:30PM	Indonesia 12 Mar, 12:00AM
Ireland 05:00PM	Israel 07:00PM	Japan 12 Mar, 02:00AM	Macao 12 Mar, 01:00AM	Mexico 11:00AM
New Zealand 12 Mar, 06:00AM	Peru 12:00PM	Philippines 12 Mar, 01:00AM	Poland 06:00PM	Portugal 05:00PM
Puerto_Rico 01:00PM	Senegal 05:00PM	Spain 06:00PM	Tunisia 06:00PM	United Kingdom 05:00PM
USA (CDT) 01:00PM	USA (PDT) 11:00AM	USA (EDT) 02:00PM		

Local Time	Presentation	Speaker Time
11:00AM		**Bolivia 01:00PM**

Speaker: **Alex Villazón**

Author: Alex Villazón

Abstract: *Collaborative development of digital learning materials in emerging regions often hinders their widespread adoption due to resource constraints, limited infrastructure, skills gaps, lack of training for teachers, and cultural or linguistic diversity. To overcome these limitations, we applied a collaborative development of digital learning materials, applying active learning methodologies such as the flipped-classroom perspective, challenge-driven learning, and the use of remote laboratories. Teachers from different regions around the world co-create learning modules that can later be reused, adapted, or translated for implementing various courses and programs. Before publication, all learning materials are peer-reviewed to ensure high quality. Several postgraduate programs in Energy are under development in different emerging regions, following an innovative educational approach. More than 42 universities collaborate across 21 countries on 4 continents with the support of 4 Erasmus+ Projects of the European Commission, aiming towards a global network of teachers to modernize collaborative digital education*

Resume: ***Alex Villazón:***

Prof. Alex Villazón is the Dean of Research in Engineering and Architecture and the Director of the CINTI Research Center at Universidad Privada Boliviana (UPB), Bolivia. He holds an MSc and a PhD in Computer Science from the University of Geneva, Switzerland. He conducted postdoctoral research at the University of Innsbruck, Austria, and at the University of Lugano, Switzerland. He has authored more than 100 papers in international journals and conferences and is one of the most cited Bolivian researchers. He has won several Science and Technology Awards in Bolivia and the 'AOSA International Award for the most influential paper of the last 10 years' in 2022. He is the coordinator of the EU-BEGP Project on digital transformation for education, funded by the European Commission under the Erasmus+ Programme. He is the co-author of the first Bolivian technological patent.

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The presentation and Q&A will last 90 minutes.

12:30PM - 2:30PM
Track
Hybrid interaction livestream on zoom Track
Session Manager: Galileo Staff.

Lunch Break

2:30PM - 4:00PM
Track 1
ONLINE oral presentations livestream on zoom Track 1
Session Manager: Galileo Staff.

ONLINE Spanish Plenary Session #3
Chair: Maria Feldgen

Plenary III: Developing communication and teamwork skills in students of the first semester of engineering (Paper # 912)

Albania 09:30PM	Argentina 05:30PM	Australia 12 Mar, 06:30AM	Bolivia 04:30PM	Brazil 05:30PM
Canada 01:30PM	Chile 05:30PM	China 12 Mar, 04:30AM	Colombia 03:30PM	Ecuador 03:30PM
Germany 09:30PM	Greece 10:30PM	Honduras 02:30PM	India 12 Mar, 02:00AM	Indonesia 12 Mar, 03:30AM
Ireland 08:30PM	Israel 10:30PM	Japan 12 Mar, 05:30AM	Macao 12 Mar, 04:30AM	Mexico 02:30PM
New Zealand 12 Mar, 09:30AM	Peru 03:30PM	Philippines 12 Mar, 04:30AM	Poland 09:30PM	Portugal 08:30PM
Puerto_Rico 04:30PM	Senegal 08:30PM	Spain 09:30PM	Tunisia 09:30PM	United Kingdom 08:30PM
USA (CDT) 04:30PM	USA (PDT) 02:30PM	USA (EDT) 05:30PM		

Local Time	Presentation	Speaker Time
2:30PM		Argentina 05:30PM

Speakers: **Julieta Yamila Zanona, Roberto Giordano Lerena**

Authors: Roberto Giordano Lerena, Julieta Yamila Zanona

Abstract: *In 2023, the subject "Introduction to Engineering" will begin to be taught in the first semester of the new study plans of the Environmental Engineering and Computer Engineering careers at the FASTA University of Mar del Plata, Argentina. The objectives of the subject and the terms of the teaching contract were set out, establishing the competencies that were intended to be developed from it and defining a series of contents and relevant practical work. The focus of the subject aims to introduce students to the fundamental concepts of engineering and contribute to the development or strengthening of "oral and written communication" and "teamwork" skills. The evaluation of the first dictation of the subject was satisfactory, not only in terms of indicators but also from the evaluation of the students themselves. This article communicates some details of the development and results of the first teaching experience of the subject Introduction to Engineering at FASTA University in 2023.*

Resume: ***Roberto Giordano Lerena:***
Roberto Giordano Lerena is graduate in software engineering, postgraduate in technology and innovation management and doctoral student in science and technology. Professor

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and Dean of the Faculty of Engineering of FASTA University, Mar del Plata, Argentina.

Julieta Yamila Zanona:
Julieta Yamila Zanona es graduate in environmental engineering and postgraduate student in renewable energy. Admission coordinator and head of practical works of the Faculty of Engineering of FASTA University, Mar del Plata, Argentina.

The presentation and Q&A will last 90 minutes.

4:00PM - 4:30PM

Track 4

Hybrid interaction livestream on zoom Track 4

Session Manager:

IN PERSON Coffee Break - VIRTUAL Coffee Break

Albania 11:00PM	Argentina 07:00PM	Australia 12 Mar, 08:00AM	Bolivia 06:00PM	Brazil 07:00PM
Canada 03:00PM	Chile 07:00PM	China 12 Mar, 06:00AM	Colombia 05:00PM	Ecuador 05:00PM
Germany 11:00PM	Greece 12 Mar, 12:00AM	Honduras 04:00PM	India 12 Mar, 03:30AM	Indonesia 12 Mar, 05:00AM
Ireland 10:00PM	Israel 12 Mar, 12:00AM	Japan 12 Mar, 07:00AM	Macao 12 Mar, 06:00AM	Mexico 04:00PM
New Zealand 12 Mar, 11:00AM	Peru 05:00PM	Philippines 12 Mar, 06:00AM	Poland 11:00PM	Portugal 10:00PM
Puerto_Rico 06:00PM	Senegal 10:00PM	Spain 11:00PM	Tunisia 11:00PM	United Kingdom 10:00PM
USA (CDT) 06:00PM	USA (PDT) 04:00PM	USA (EDT) 07:00PM		

4:30PM - 6:00PM

Track 1

IN PERSON oral presentations and online livestream on zoom Track 1

Session Manager: Galileo Staff.

HYBRID Spanish Technical Session #1

Chair: Héctor Amado-Salvatierra

Balancing Algorithms and Values: Exploring Ethical Dimensions in Machine Learning

Albania 11:30PM	Argentina 07:30PM	Australia 12 Mar, 08:30AM	Bolivia 06:30PM	Brazil 07:30PM
Canada 03:30PM	Chile 07:30PM	China 12 Mar, 06:30AM	Colombia 05:30PM	Ecuador 05:30PM
Germany 11:30PM	Greece 12 Mar, 12:30AM	Honduras 04:30PM	India 12 Mar, 04:00AM	Indonesia 12 Mar, 05:30AM
Ireland 10:30PM	Israel 12 Mar, 12:30AM	Japan 12 Mar, 07:30AM	Macao 12 Mar, 06:30AM	Mexico 04:30PM
New Zealand 12 Mar, 11:30AM	Peru 05:30PM	Philippines 12 Mar, 06:30AM	Poland 11:30PM	Portugal 10:30PM
Puerto_Rico 06:30PM	Senegal 10:30PM	Spain 11:30PM	Tunisia 11:30PM	United Kingdom 10:30PM
USA (CDT) 06:30PM	USA (PDT) 04:30PM	USA (EDT) 07:30PM		

Local Time	Presentation

4:30PM **Speaker:** **Rosalino Rodríguez Calderón**

Title: **Learning based on artificial intelligence for engineering courses (Paper # 817)**

Authors: Rosalino Rodríguez-Calderón, Salvador González-García

Abstract *This paper describes the impact on the learning, of university students, that has the process of designing and implementing Chatbots like pedagogical strategy in engineering subjects. To validate*

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the proposal, experimentation was carried in two courses, "Industrial Robotics" and "Engineering and Science Modeling". After a descriptive statistical analysis, results indicate that this novel form of teaching generates motivation as well as engagement and learning.

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM **Speaker:** **Jhoan Sebastian Tenjo García**

Title: **Analysis of Student Dropout in Industrial Engineering Students Using Computational Intelligence Techniques (Paper # 884)**

Authors: Jhoan Sebastian Tenjo-García, Juan Carlos Figueroa-García

Abstract *Industrial Engineering attracts diverse students because it offers versatile career opportunities; however, student attrition remains a significant concern. This study employs computational intelligence techniques to analyze a data set from the Universidad Distrital Francisco José de Caldas. Through data refinement processes, including statistical analysis, clustering methods and predictive modeling, our goal is to ensure data integrity and unveil the dynamics of student dropout in Industrial Engineering. We also present the effectiveness of computational intelligence in understanding dropout behavior. The study provides valuable information for education professionals and policymakers.*

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Speakers:** **Hector R. Amado-Salvatierra, Miguel Morales-Chan, Milvia Rosales, Rocael Hernández-Rizzardini**

Title: **Exploring Educators' Perceptions: Artificial Intelligence Integration in Higher Education (Paper # 893)**

Authors: Hector R. Amado-Salvatierra, Miguel Morales-Chan, Rocael Hernández-Rizzardini, Milvia Rosales

Abstract *This article presents a thorough examination of the practical applications and impacts of generative artificial intelligence (AI) in education from the perspective of educators. It explores how educators integrate AI technologies and tools into their teaching experiences, addressing the challenges they face and the benefits they perceive in educational settings. Employing a descriptive quantitative methodology with a study population of 80 active educators, the research offers valuable insights into the intersection of AI and pedagogical practices in higher education. The findings not only contribute to the academic discourse on AI in education but also start to establish a foundational resource for educators, administrators, and policymakers. This work enhances understanding and informs strategic decisions for those seeking to optimize the integration of AI technologies and Generative AI tools within the dynamic landscape of higher education, promoting innovation and effective utilization of AI for enhanced learning experiences.*

Presentation time 15 minutos and 5 minutes for Q&A

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4:30PM - 6:00PM

Track 2

ONLINE oral presentations livestream on zoom Track 2

Session Manager: Ana Luna & Mario Chong

ONLINE English Technical Session #1

Chair: Todd Cochrane

Exploring the Future: Hybrid Learning Environments and Assessment Strategies

Albania 11:30PM	Argentina 07:30PM	Australia 12 Mar, 08:30AM	Bolivia 06:30PM	Brazil 07:30PM
Canada 03:30PM	Chile 07:30PM	China 12 Mar, 06:30AM	Colombia 05:30PM	Ecuador 05:30PM
Germany 11:30PM	Greece 12 Mar, 12:30AM	Honduras 04:30PM	India 12 Mar, 04:00AM	Indonesia 12 Mar, 05:30AM
Ireland 10:30PM	Israel 12 Mar, 12:30AM	Japan 12 Mar, 07:30AM	Macao 12 Mar, 06:30AM	Mexico 04:30PM
New Zealand 12 Mar, 11:30AM	Peru 05:30PM	Philippines 12 Mar, 06:30AM	Poland 11:30PM	Portugal 10:30PM
Puerto_Rico 06:30PM	Senegal 10:30PM	Spain 11:30PM	Tunisia 11:30PM	United Kingdom 10:30PM
USA (CDT) 06:30PM	USA (PDT) 04:30PM	USA (EDT) 07:30PM		

Local Time	Presentation	Speaker Time

4:30PM **Speaker:** **Lasitha Piyathilaka** **Australia 12 Mar, 08:30AM**

Title: **Enhanced Learner Interactions and Academic Integrity with Bespoke Interactive Online Tutorials in a Hybrid Learning Model (Paper # 844)**

Authors: Jay Sul, Lasitha Piyathilaka, Farzaneh Tahmoorian, Gayan Kahandawa, Prasad Gudimetla

Abstract *Conventional teaching methods have morphed into blended and hybrid learning models with the evolution of online platforms. These have gained importance and popularity during and post-COVID-19. While the previous studies reported great success in this transition, they are mainly oriented around flexibility and learner interactions with online materials, instead of interactions with instructors. This paper discusses the development and implementation of interactive online tutorials to enhance hybrid learning in a first-year engineering subject over six years. These tutorials were designed not only to replicate the benefits of face-to-face tutorial classes, but also to enhance student interactions and engagement with teaching staff, and to detect potential academic misconduct. This study found that the interactive online tutorials (i) provided a motivational and positive learning experience to all students, (ii) narrowed the gap in satisfaction levels between on-campus and online students, and (iii) benefited the higher academic achievers within the online student cohorts.*

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM **Speaker:** **Lasitha Piyathilaka** **Australia 12 Mar, 08:50AM**

Title: **Navigating the New Normal: Student Perspectives on Transitioning from Online to Face-to-Face Learning after COVID-19 Lockdowns (Paper # 867)**

Authors: Amal Jayawardena, Gayan Kahandawa, Hasitha Hewawasam, Lasitha Piyathilaka, Jay Sul

Abstract *This paper explores the transition from online learning to face-to-face learning in the aftermath of the COVID-19 pandemic. Based on a survey conducted among students in engineering classes, the study investigates the challenges and preferences experienced during this critical period. The survey responses provide valuable insights into lecture delivery methods, time management, social skills, workload comparisons, and the support required for a successful transition. The findings highlight the preference for a hybrid approach that combines the benefits of both online and face-to-face learning. Flexibility in*

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scheduling, access to digital resources, and personalized learning experiences emerged as key factors influencing student satisfaction. Additionally, the survey identifies the need for effective time management strategies, social skills development, and mental health support during the transition. By prioritizing student needs and preferences, educational institutions can create a supportive and engaging learning environment that promotes academic success and well-being in the post-pandemic education landscape.

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Speaker:** **Todd Cochrane** **New Zealand 12 Mar, 12:10P**

Title: **Comparing trainee learning(experience) graphs, to understand and compare training systems – hDAS Phase One. (Paper # 821)**

Author: Todd Cochrane

Abstract *To determine ways to compare educational processes simple graph models of trainee learning trajectories are studied through educational design-based research. As trainees move towards becoming part of a discipline, they develop skills that, through practice, enhance their identity as members of that discipline. Trainees develop their skills starting from their situation in life. That situation identifies pre-requisite skills or the need for equity in their journey. The process can be thought of as a learning path or trajectory that moves the learner further into becoming a fully participant member of the discipline. A graph-based model of vocational trainee trajectories is to be produced that intentionally attempts to understand and reduce situational constraints. Models derived from currently operating Information Technology educational organizations, and a proposed educational organization using the graph representation are to be compared. Derivation of these graphs is guided by legitimate peripheral participation as situated, learner focused educational theory.*

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM **Speaker:** **Takumi Kobara** **Japan 12 Mar, 08:30AM**

Title: **Work in progress: Rubrics to Assess Learning Effectiveness of Artificial Intelligence Education for K-12 (Paper # 866)**

Authors: Takumi Kobara, Daisuke Saito, Hironori Washizaki, Yoshiaki Fukazawa

Abstract *The need for artificial intelligence (AI) education is increasing; however, the literature includes few studies related to the learning effectiveness of AI education for K-12 students. In the present study, we developed analytic rubrics to examine the learning effects of AI education for K-12 students and evaluated the rubrics' reliability through an AI educational workshop. The results of the study suggest that, although the rubric was internally consistent, inter-rater reliability was problematic. The aforementioned results indicate that a more specifically modified rubric and an appropriate method of measuring learning outcomes are needed.*

Presentation time 15 minutos and 5 minutes for Q&A

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4:30PM - 6:00PM

Track 3

ONLINE oral presentations livestream on zoom Track 3

Session Manager: Osvaldo Clua

ONLINE English Technical Session #2

Chair: Russel E. Walker

Shaping Futures: Exploring Curriculum Design, Ethics, and Assessment

Albania 11:30PM	Argentina 07:30PM	Australia 12 Mar, 08:30AM	Bolivia 06:30PM	Brazil 07:30PM
Canada 03:30PM	Chile 07:30PM	China 12 Mar, 06:30AM	Colombia 05:30PM	Ecuador 05:30PM
Germany 11:30PM	Greece 12 Mar, 12:30AM	Honduras 04:30PM	India 12 Mar, 04:00AM	Indonesia 12 Mar, 05:30AM
Ireland 10:30PM	Israel 12 Mar, 12:30AM	Japan 12 Mar, 07:30AM	Macao 12 Mar, 06:30AM	Mexico 04:30PM
New Zealand 12 Mar, 11:30AM	Peru 05:30PM	Philippines 12 Mar, 06:30AM	Poland 11:30PM	Portugal 10:30PM
Puerto_Rico 06:30PM	Senegal 10:30PM	Spain 11:30PM	Tunisia 11:30PM	United Kingdom 10:30PM
USA (CDT) 06:30PM	USA (PDT) 04:30PM	USA (EDT) 07:30PM		

Local Time	Presentation	Speaker Time

4:30PM **Speaker:** **Paola Palomino Flores** **Peru 05:30PM**

Title: **Mastering Ethical Horizons: Exploring AI Integration in Advanced Studies of Engineering, Technology, and Informatics (Paper # 904)**

Authors: Paola Palomino-Flores, Ricardo Cristi-López, David Paul

Abstract *This study explores the integration of ethical principles and responsible AI usage in postgraduate engineering, technology, and computer science programs. It focuses on master's students' perceptions, particularly regarding ethical concerns in AI. A comprehensive methodology, including detailed interviews and an extensive literature review, is used. The literature review covers current educational practices, the effects of increasing data use, AI's transformative role in education, the EdTech industry's influence, and ethical issues in technological advancements. Thirty interviews provide a basis for comparative analysis, highlighting educational gaps and improvement areas. The study introduces two innovative solutions: the Simulated Ethical Dilemmas (SED) Framework and the Ethics Informed Design Thinking (EIDT) Curriculum. SED immerses students in real-life AI ethical scenarios, fostering critical thinking. EIDT focuses on a proactive, human-centric AI development approach, emphasizing ethics. These solutions aim to enhance AI ethics education, preparing students for the evolving ethical challenges in future AI technologies.*

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM **Speaker:** **Wan Chong Choi** **USA (CDT) 06:50PM**

Title: **Discovering Programming Talent and Improving Learning Motivation with CodeCombat in K-12 Education (Paper # 847)**

Authors: Wan Chong Choi, Iek Chong Choi

Abstract *Nurturing programming talent early is crucial in today's digital world, especially in K-12 education, underscored by the rise of programming competitions for younger students. However, with limited research in programming talent search, discovering programming talent in primary schools posed a significant challenge. Traditionally, various test-based talent search tools have been utilized for programming talent identification, including the Computer Talent Search Test (CTST) and the Beginners Computational Thinking Test (BCTt). Game-based platforms like CodeCombat offer an engaging alternative to overcome*

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this challenge. CodeCombat integrates game-based learning with programming education, allowing students to apply their computational thinking skills in an enjoyable context for learning Python. The study revealed a significant correlation between CodeCombat, CTST, and BCTt outcomes. This highlighted that CodeCombat emerged as a valuable platform for talent search, aligning seamlessly with the objectives of the test-based tools and suggesting its effectiveness in boosting programming learning motivation in primary school.

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Speaker:** **Wan Chong Choi** **USA (CDT) 07:10PM**

Title: **Investigating the Effect of the Serious Game CodeCombat on Cognitive Load in Python Programming Education (Paper # 851)**

Authors: Wan Chong Choi, Iek Chong Choi

Abstract *Understanding the cognitive demands that programming places on young learners has become increasingly important. The Cognitive Load Theory (CLT) provided a framework with three dimensions, including intrinsic, extraneous, and germane load. Our findings derived from paired sample t-tests comparing pre-test and post-test results, indicated significant improvements in all three dimensions. Moreover, we observed notable interrelationships between these loads, where a reduction in intrinsic and extraneous loads corresponded with an increase in germane load. This suggested an effective balance between simplifying the complex subject matter and enhancing learner engagement, underlining the nuanced interplay in the learning environment facilitated by CodeCombat. These results contributed valuable insights into the role of serious games in reducing cognitive overload and enhancing learning experiences in complex subjects like programming. The study underscored the potential of interactive educational tools in early Python programming education, offering implications for primary school teaching strategies and curriculum design.*

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM **Speaker:** **Russell E. Walker** **USA (PDT) 05:30PM**

Title: **Mapping Curricula to Skills and Occupations Using Course Descriptions (Paper # 818)**

Author: Russell E. Walker

Abstract *Aligning STEM curricula with skills and occupations benefits students, employers, and educational institutions. However, manual curriculum mapping to assess alignment is labor-intensive and does not scale well. This study evaluated the use of natural language processing (NLP) to automate mapping curricula to skills and occupations. An open-source NLP tool was applied to extract skills from course descriptions in data science programs at two institutions, and from occupation descriptions from the US Department of Labor's O*NET database. Occupations were ranked by similarity between curriculum and occupation skill sets. Occupations were classified as relevant or nonrelevant to data science and analytics, and the standard information retrieval metric of precision@N was calculated. Skill extraction identified an average of 5.3-10.4 skills/course, and precision@5 was 60%-100%. There appears to be strong potential for using NLP of course descriptions to map curricula to skills and occupations, at least as a starting point for manual refinement.*

Presentation time 15 minutos and 5 minutes for Q&A

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4:30PM - 6:00PM

Track 4

ONLINE oral presentations livestream on zoom Track 4

Session Manager: Maria Feldgen

ONLINE Spanish Technical Session #2

Chair: Maria Feldgen

Exploring STEM Horizons: Innovations in K12 and Higher Education

Albania 11:30PM	Argentina 07:30PM	Australia 12 Mar, 08:30AM	Bolivia 06:30PM	Brazil 07:30PM
Canada 03:30PM	Chile 07:30PM	China 12 Mar, 06:30AM	Colombia 05:30PM	Ecuador 05:30PM
Germany 11:30PM	Greece 12 Mar, 12:30AM	Honduras 04:30PM	India 12 Mar, 04:00AM	Indonesia 12 Mar, 05:30AM
Ireland 10:30PM	Israel 12 Mar, 12:30AM	Japan 12 Mar, 07:30AM	Macao 12 Mar, 06:30AM	Mexico 04:30PM
New Zealand 12 Mar, 11:30AM	Peru 05:30PM	Philippines 12 Mar, 06:30AM	Poland 11:30PM	Portugal 10:30PM
Puerto_Rico 06:30PM	Senegal 10:30PM	Spain 11:30PM	Tunisia 11:30PM	United Kingdom 10:30PM
USA (CDT) 06:30PM	USA (PDT) 04:30PM	USA (EDT) 07:30PM		

Local Time	Presentation	Speaker Time

4:30PM **Speaker:** **Alonso Iraola Arroyo** **Peru 05:30PM**

Title: **A Psycho-Pedagogical Evaluation of Well-Being Levels: A Study with Aspirants to an Engineering Career (Paper # 877)**

Authors: Alonso Iraola-Arroyo, Ivan Iraola-Real

Abstract *Being admitted to study engineering at public universities in Peru is a challenge that affects the psychological well-being of students. For these reasons, this study aimed to analyze the levels of psychological well-being (satisfaction with life) in students who undertake pre-university studies to be admitted to engineering careers in a prestigious public university in Peru. Ninety-five students participated; 74 (77.9%) were male and 19 (20.0%); 2 (2.1%) did not indicate their gender. Ages ranged from 16 to 24 years (Mean = 18.15; SD = 1.40). Finally, the results showed a medium level and indecision in feeling psychological well-being (or being satisfied with their lives). In addition, it was observed that the longer the time spent in pre-university studies, the lower the level of psychological well-being. In addition, taking several attempts at the entrance exams does not affect their level of well-being.*

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM **Speaker:** **Alonso Iraola Arroyo** **Peru 05:50PM**

Title: **Academic Self-Efficacy According to the University Selected to Study: A Comparative Study with Aspirants to Engineering Careers (Paper # 878)**

Authors: Alonso Iraola-Arroyo, Ivan Iraola-Real

Abstract *Entering public universities in Peru to study engineering is a very competitive challenge, which demands that pre-university students have adequate self-efficacy and good academic performance. Therefore, this study proposes to analyze the levels of self-efficacy and academic performance according to the university to which aspiring engineering students from Lima - Peru apply. The total number of pre-university students was 161; of which 122 (75.8%) were male and 39 (24.2%) were female. Their ages ranged from 16 to 22 years (Mean = 17.66; SD = 1.31). Of these, 110 (68.3%) were from Lima (capital city of Peru) and 51 (31.7%) from the provinces. The results allowed us to conclude that students often and sometimes feel academically self-efficient; only in particular cases the*

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perception is lower. However, academic performance turned out to be disapproving in most cases.

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Speaker:** **Sdenka Zobeida SALAS PILCO** **China 12 Mar, 07:10AM**

Title: **K-12 STEAM Education in Latin America: A Systematic Review (Paper # 906)**

Author: Sdenka Zobeida Salas-Pilco

Abstract *Over the past decade, there has been a steady growth in the adoption of STEAM (Science, Technology, Engineering, Arts, and Mathematics) education. This study seeks to systematically review the state of K-12 STEAM education in Latin America. The study analyzed 18 published articles from 2018 to 2022, that reported learning outcomes regarding to the application of STEAM strategies. The findings indicate that main benefits are: the female empowerment, the increased student engagement and motivation, and the development of students' creativity. However, the study also identified some challenges such as a lack of teacher professional development in STEAM, and the absence of an interdisciplinary curriculum. In general, Latin American countries are actively working towards implementing the STEAM approach in their education systems.*

Presentation time 15 minutos and 5 minutes for Q&A

6:00PM - 8:00PM

IN PERSON Welcome coctail

Albania 12 Mar, 01:00AM	Argentina 09:00PM	Australia 12 Mar, 10:00AM	Bolivia 08:00PM	Brazil 09:00PM
Canada 05:00PM	Chile 09:00PM	China 12 Mar, 08:00AM	Colombia 07:00PM	Ecuador 07:00PM
Germany 12 Mar, 01:00AM	Greece 12 Mar, 02:00AM	Honduras 06:00PM	India 12 Mar, 05:30AM	Indonesia 12 Mar, 07:00AM
Ireland 12 Mar, 12:00AM	Israel 12 Mar, 02:00AM	Japan 12 Mar, 09:00AM	Macao 12 Mar, 08:00AM	Mexico 06:00PM
New Zealand 12 Mar, 01:00PM	Peru 07:00PM	Philippines 12 Mar, 08:00AM	Poland 12 Mar, 01:00AM	Portugal 12 Mar, 12:00AM
Puerto_Rico 08:00PM	Senegal 12 Mar, 12:00AM	Spain 12 Mar, 01:00AM	Tunisia 12 Mar, 01:00AM	United Kingdom 12 Mar, 12:00AM
USA (CDT) 08:00PM	USA (PDT) 06:00PM	USA (EDT) 09:00PM		

Local Time	Presentation
6:00PM	**Speaker:** **Roberto Portillo (Conference Chair)** **Summary:** *All the participants are welcome to join us for the "Cocktail Party". It is the opportunity to get in touch with other colleagues and make new friends in a pleasant cultural environment.*