



Empowering Engineering Education: Breaking barriers through research and innovation

TUESDAY, March 12, 2024

08:00AM - 6:00PM



IN PERSON Registration

09:00AM - 10:30AM

Track 1

ONLINE oral presentations livestream on zoom Track 1

Session Manager: Galileo Staff.



ONLINE English Plenary Session #4

Chair: Ana Luna



Plenary IV: Adding Service Learning into the Engineering Classroom Experience (Paper # 914)

Albania 04:00PM	Argentina 12:00PM	Australia 13 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 13 Mar, 12:00AM	Macao 11:00PM	Mexico 09:00AM
New Zealand 13 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	Speaker Time
09:00AM		USA (EDT) 12:00PM

Speakers: Dan Budny, Frank Kremm, Jennifer Nolan-Kremm

Authors: Dan Budny, Frank Kremm, Jennifer Nolan-Kremm

Abstract: *By working on real world engineering projects, students practice their design and calculation skills. They also develop team work, effective communication, and community engagement through service learning experience. Adding the international exposure to senior design further improve students motivation to provide engineering services to communities in need by changing students mindset to engage them to the whole new world with all political, social, environmental and economical limitations. This talk will give examples of our various projects, lessons learned and show how adding project based service learning in the undergraduate curriculum has been found to have positive impacts on students' motivation, attitude and experience.*

The presentation and Q&A will last 90 minutes.



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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 13 Mar, 02:30AM	Bolivia 12:30PM	Brazil 01:30PM
Canada 09:30AM	Chile 01:30PM	China 13 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 13 Mar, 01:30AM	Macao 13 Mar, 12:30AM	Mexico 10:30AM
New Zealand 13 Mar, 05:30AM	Peru 11:30AM	Philippines 13 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		

11:00AM - 12:30PM

Track 1

ONLINE oral presentations livestream on zoom Track 1

Session Manager: Galileo Staff.



ONLINE English Round-Table Session #1

Chair: Melany M. Ciampi



Track_1

Round Table: IEEE Division 6 Societies Empowering Engineering Education (Paper # 913)

Albania 06:00PM	Argentina 02:00PM	Australia 13 Mar, 03:00AM	Bolivia 01:00PM	Brazil 02:00PM
Canada 10:00AM	Chile 02:00PM	China 13 Mar, 01:00AM	Colombia 12:00PM	Ecuador 12:00PM
Germany 06:00PM	Greece 07:00PM	Honduras 11:00AM	India 10:30PM	Indonesia 13 Mar, 12:00AM
Ireland 05:00PM	Israel 07:00PM	Japan 13 Mar, 02:00AM	Macao 13 Mar, 01:00AM	Mexico 11:00AM
New Zealand 13 Mar, 06:00AM	Peru 12:00PM	Philippines 13 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
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11:00AM

USA (EDT) 02:00PM

Speakers: Kamal Al-Haddad, Martín Llamas-Nistal, Milos Manic, John Allen, Andrea Belz, Steven Li, Alan Chong, Luis Kun.

Authors: Kamal Al-Haddad, Martín Llamas-Nistal, Milos Manic, John Allen, Andrea Belz, Steven Li, Alan Chong, Luis Kun.

Abstract: This article was organized to introduce the societies that make up Division 6 of the IEEE. The IEEE Institute of Electrical and Electronics Engineers has 39 Technical Societies and these Societies are organized in 10 Divisions. Division 6 is comprised of the following 7 IEEE societies: Education Society (EDS), Industrial Electronics Society (IES), Product Safety Engineering Society (PSES), Technology and Engineering Management Society (TEMS), Reliability Society (RLS), Professional Communication Society (PCS) and Society on Social Implications of Technology (SSIT). This work, which will be presented as a



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Round Table, will be moderated by the Director of Division 6 and the 7 speakers will be the presidents of the societies that are part of this division.

Resume: **Kamal Al-Haddad, Director of IEEE Division VI. Martín Llamas-Nistal, President of IEEE Education Society**
The presentation and Q&A will last 90 minutes.

12:30PM - 1:00PM
Track 1
Hybrid interaction livestream on zoom Track 1
Session Manager: Galileo Staff.



HYBRID Photo Session



Albania 07:30PM	Argentina 03:30PM	Australia 13 Mar, 04:30AM	Bolivia 02:30PM	Brazil 03:30PM
Canada 11:30AM	Chile 03:30PM	China 13 Mar, 02:30AM	Colombia 01:30PM	Ecuador 01:30PM
Germany 07:30PM	Greece 08:30PM	Honduras 12:30PM	India 13 Mar, 12:00AM	Indonesia 13 Mar, 01:30AM
Ireland 06:30PM	Israel 08:30PM	Japan 13 Mar, 03:30AM	Macao 13 Mar, 02:30AM	Mexico 12:30PM
New Zealand 13 Mar, 07:30AM	Peru 01:30PM	Philippines 13 Mar, 02:30AM	Poland 07:30PM	Portugal 06:30PM
Puerto_Rico 02:30PM	Senegal 06:30PM	Spain 07:30PM	Tunisia 07:30PM	United Kingdom 06:30PM
USA (CDT) 02:30PM	USA (PDT) 12:30PM	USA (EDT) 03:30PM		

Local Time **Presentation**

12:30PM Summary: *We are pleased to invite you to a photo session with all EDUNINE participants (in person and virtually)!*

1:00PM - 2:30PM
Track
Hybrid interaction livestream on zoom Track
Session Manager: Galileo Staff.



Lunch Break



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2:30PM - 4:00PM

Track 1

IN PERSON oral presentations and online livestream on zoom Track 1

Session Manager: Galileo Staff.



HYBRID English Technical Session #3



Chair: Roberto Portillo

Exploring Boundaries: Innovations in Learning Environments

Albania 09:30PM	Argentina 05:30PM	Australia 13 Mar, 06:30AM	Bolivia 04:30PM	Brazil 05:30PM
Canada 01:30PM	Chile 05:30PM	China 13 Mar, 04:30AM	Colombia 03:30PM	Ecuador 03:30PM
Germany 09:30PM	Greece 10:30PM	Honduras 02:30PM	India 13 Mar, 02:00AM	Indonesia 13 Mar, 03:30AM
Ireland 08:30PM	Israel 10:30PM	Japan 13 Mar, 05:30AM	Macao 13 Mar, 04:30AM	Mexico 02:30PM
New Zealand 13 Mar, 09:30AM	Peru 03:30PM	Philippines 13 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
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2:30PM Speaker: Katsuyuki Umezawa
Title: Differential analysis of heart rate, facial expressions and brain wave during learning of visual- and text-based languages (Paper # 800)
Authors: Katsuyuki Umezawa, Takumi Koshikawa, Makoto Nakazawa, Shigeichi Hirasawa
Abstract *From 2020, programming education has become compulsory in elementary schools. Visual-based programming languages are becoming popular as an introduction to programming. At universities, students learn text-based programming languages such as C and Java. Much research has been conducted on the transition from visual- to text-based programming languages. However, most related studies are limited to questionnaire evaluation after learning. In this study, we focus on evaluation during learning. Specifically, 18 types of biometric information (heart rate, 12 facial expressions, and 5 types of brain waves) of learners are measured during visual- and text-based programming language learning. According to the experimental results, the values of "sadness" and "brain wave representing difficulty" were higher when using a visual-based programming language than when using a text-based programming language. Furthermore, the difference was larger in the group with poor keyboard input skills. This group performed the task while feeling contempt, sadness, negative emotions, and difficulties.*

Presentation time 15 minutos and 5 minutes for Q&A

02:50PM Speaker: Ricardo Alexandre Peixoto de Queirós
Title: Work in progress: Leveraging Virtual Escape Rooms for Innovative Computer Programming Learning Environments (Paper # 832)
Authors: Ricardo Queirós, Carla M. A. Pinto, Mário Cruz
Abstract *This paper explores the integration of virtual escape rooms as innovative educational tools in the realm of computer programming. Recognizing the need to engage and motivate learners in this complex domain, we investigate the use of virtual escape rooms in a typical educational setting where Learning Management Systems play a pivotal role. The paper starts by surveying existing escape rooms designed for teaching programming and related domains, considering factors such as interactivity, educational efficacy, and learner engagement. Additionally, it is emphasized the role of standards in creating interoperable learning environments, introducing IMS LTI for seamless integration with learning management systems and xAPI for tracking learner activities within escape rooms. By*



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leveraging these standards and a Learning Record Store (LRS) as a central repository, an architectural framework is presented which enables personalized learning experiences and data-driven insights, catering to the diverse needs and preferences of the new generation of learners.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM Speakers: Johannes Nau, Karsten Henke

Title: GOLDi Labs as fully integrated Learning Environment (Paper # 839)

Authors: Johannes Nau, Karsten Henke

Abstract *Our vision is that an online lab will no longer be seen as a collection of monolithically constructed experiments but as a collection of laboratory devices communicating with each other. Nowadays, many interested learners have their own hardware at home. Therefore, an extension to the GOLDi remote lab, we provide learners with an interface unit, which in turn means: they can easily connect to this interface with their control units and thus have the possibility to control these complex hardware models (from home). The availability of learning management systems and their LTI extensibility ultimately leads to a fully integrated learning environment.*

Presentation time 15 minutos and 5 minutes for Q&A

03:30PM Speaker: Vahab Pournaghshband

Title: Entailing Security Mindset in Foundational CS Courses: An Interactive Approach (Paper # 838)

Authors: Vahab Pournaghshband, Hassan Pournaghshband

Abstract *The integration of computer security courses into computing curricula has become standard practice. However, these courses are often deferred to later stages of the curriculum due to the perceived need for advanced computer science knowledge. This deferral perpetuates the lack of a security mindset, leading to overlooked security vulnerabilities in students' code. This study advocates for the early introduction of security-related courses, ideally in introductory computing courses, by proposing an interactive teaching approach to instill a security mindset in students. We present a method employing a security-oriented programming assignment graded primarily on understanding conventional computing concepts. This approach progressively introduces critical security principles and practices through the interactive assignment, inherently security-sensitive, involving the implementation of application programming interfaces for routine software operations. The paper outlines our approach's steps, discusses essential security concepts and their integration, and outlines an evaluation methodology to measure the effectiveness of our approach.*

Presentation time 15 minutos and 5 minutes for Q&A



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2:30PM - 4:00PM

Track 2

ONLINE oral presentations livestream on zoom Track 2

Session Manager: Mario Chong



ONLINE English Technical Session #4

Chair: Mario Chong



Exploring Pedagogical Frontiers: Insights from Teaching, Research, and Innovation

Albania 09:30PM	Argentina 05:30PM	Australia 13 Mar, 06:30AM	Bolivia 04:30PM	Brazil 05:30PM
Canada 01:30PM	Chile 05:30PM	China 13 Mar, 04:30AM	Colombia 03:30PM	Ecuador 03:30PM
Germany 09:30PM	Greece 10:30PM	Honduras 02:30PM	India 13 Mar, 02:00AM	Indonesia 13 Mar, 03:30AM
Ireland 08:30PM	Israel 10:30PM	Japan 13 Mar, 05:30AM	Macao 13 Mar, 04:30AM	Mexico 02:30PM
New Zealand 13 Mar, 09:30AM	Peru 03:30PM	Philippines 13 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	Speaker: Bianca Cassemiro Lima	Brazil 05:30PM

Title: Teaching Robotic Concepts Using Project-Based Learning: A Case Study (Paper # 819)

Authors: Bianca Cassemiro Lima, Henrique Mohallem Paiva, Marcos R. O. A Maximo

Abstract *Project-based learning (PBL) is a methodology in which students learn concepts by carrying out real projects. PBL involves the direct participation of students in the practical application of the contents they are learning, promoting engagement and the development of various skills that would not be acquired through passive or individual studies. This article aims to analyze the use of PBL in teaching industrial automation concepts to 43 undergraduate Computer Engineering students. The case exploited was the concept of an industrial automation system. To support this project and validate the methodology used, data from a computing college and a partner company are considered. The technology college employs an innovative teaching methodology fully based on PBL, while the partner company has proposed a real industrial automation project to be carried out by undergraduate students. The results of this research are relevant for investigating new teaching methodologies in engineering education.*

Presentation time 15 minutos and 5 minutes for Q&A

02:50PM	Speaker: Consuelo Cano	Peru 03:50PM
	Title: Work in Progress: Building Bridges Between Multidisciplinary STEAM Researches (Paper # 892)	

Author: Consuelo Cano

Abstract *The research explores the interaction between art and science, focusing on its strategic management in university research groups in Peru. From the perspective of STEAM education, we study how the integration of science, technology, engineering, art and mathematics fosters innovation and critical thinking. Adopting a socio-constructivist and qualitative approach, this research is based on a multiple case analysis, using semi-structured interviews and documentary review. This approach allows for a deep*



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understanding of the dynamics and challenges in interdisciplinary collaboration, in order to identify crucial factors that facilitate or impede synergy between these disciplines. The investigation aspires to discover and propose effective practices and tools to reinforce artistic-scientific collaboration, promoting an innovative and creative approach in research and higher education, in line with the demands and challenges of the 21st century.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM Speaker: Andres Esteban Acero Lopez Mexico 03:10PM

Title: Work in Progress: Insights from Collaborative Learning and Research Innovation at Tecnologico de Monterrey (Paper # 828)

Authors: Andres Acero, Xavier Cazares

Abstract *This paper advocates for the incorporation of Research-Based Learning (RBL) in the Industrial and Systems Engineering program at Tecnologico de Monterrey Puebla Campus, illustrating its positive impact on student collaboration and the integration of theory and practice. The study involves 17 students who, through RBL, simultaneously apply acquired knowledge and conduct research on information technology deployment in nano-stores. The RBL strategy enhances the teaching of industrial engineering by reinforcing fundamental aspects, fostering evidence-based decision-making skills, and moving away from opinion-based models. This approach prepares students for the dynamic demands of the industrial engineering field, exemplifying a successful integration of RBL techniques in the classroom environment.*

Presentation time 15 minutos and 5 minutes for Q&A

03:30PM Speaker: Andres Esteban Acero Lopez Mexico 03:30PM

Title: The academical and emotional impact of extracurricular activities on engineering college students (Paper # 834)

Authors: Santiago Gutierrez, Andres Acero, Isaac Olivas, Jorge Alberto González-Mendívil, Eduardo Caballero-Montes

Abstract *The student's academic performance is highly mediated by their motivation, social relationships, and mentoring. However, studies have proven that the lack of motivation will lead to lower grades, disliking their actual university, or even dropping out from higher education. Even more, researchers have found that motivation can be improved through the inclusion of extracurricular activities. However, few studies have been done in Latin America trying to understand the relationship of these activities the educational achievement. Consequently, this study will compare the engineering students involved in extracurricular activities with those who don't and their academic performance. This study will also analyze the stress symptoms to know if the extracurricular activities reduce them. To compare between groups, the grades of the electives in the areas of Science and Mathematics will be used. Lastly, this research will see the requirements of a student to recommend their university to other people.*

Presentation time 15 minutos and 5 minutes for Q&A



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2:30PM - 4:00PM
Track 3
ONLINE oral presentations livestream on zoom Track 3
Session Manager: Ana Luna



ONLINE English Technical Session #5

Chair: Fernando Martell Chavez



Expanding Horizons: Innovations in Learning and Teaching

Albania 09:30PM	Argentina 05:30PM	Australia 13 Mar, 06:30AM	Bolivia 04:30PM	Brazil 05:30PM
Canada 01:30PM	Chile 05:30PM	China 13 Mar, 04:30AM	Colombia 03:30PM	Ecuador 03:30PM
Germany 09:30PM	Greece 10:30PM	Honduras 02:30PM	India 13 Mar, 02:00AM	Indonesia 13 Mar, 03:30AM
Ireland 08:30PM	Israel 10:30PM	Japan 13 Mar, 05:30AM	Macao 13 Mar, 04:30AM	Mexico 02:30PM
New Zealand 13 Mar, 09:30AM	Peru 03:30PM	Philippines 13 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	<p>Speaker: Nádía Kozievitch</p> <p>Title: Digital Citizenship in Brazil - Insights from a Workshop to Inspire K-8 Teachers (Paper # 862)</p> <p>Authors: Patricia A. Turato, Mayara D. V. Hoger, Bruna O. Amador, Bruno C. Julian, Caio A. P. Fodra, Nádía P. Kozievitch, Rita C. G. Berardi</p> <p>Abstract <i>Given that contact with the Digital World occurs from a very early age, educators play a vital role in preparing children for this topic. Educators, on the other hand, need support to approach computing in a multidisciplinary way, with subjects already present in the curriculum. In this direction, this article presents three approaches to the "Digital Citizenship" workshop to K-8 teachers. The objective of the workshop is to introduce subjects such as Artificial Intelligence (AI), Digital Citizenship and Digital Culture, so that they can replicate it in the classroom. Insights after each workshop guided the evolution of the three approaches and are explored in this paper. Results indicated that even having topics which are less technical and (theoretically) simpler in the context of computing, it is not trivial to be able to address the impacts of technology use on society.</i></p> <p style="text-align: center;"><i>Presentation time 15 minutos and 5 minutes for Q&A</i></p>	Brazil 05:30PM

02:50PM	<p>Speaker: Juan Pablo Rivera Arbeláez</p> <p>Title: Work in Progress: Learning by Doing and Maker Movement in Engineering Education, A Student Group's Experience (Paper # 807)</p> <p>Authors: Juan Pablo Rivera Arbeláez, Dayana Katerin Paredes Melo, Sofia Milagros Castaño Vanegas, Leonardo Saavedra Munar</p> <p>Abstract <i>This paper delves into the learning experience of a student group from a university, which embarked on a journey guided by the methodologies of Learning by Doing and Maker Movement. These approaches have supplied a fertile ground for holistic learning among engineering students, fostering skill development, critical thinking, collaboration, creativity, soft skills, and scientific investigation. The paper underscores the culmination of this experience through a final task, the design of a drone specialized in search and rescue in disaster areas, highlighting the application of acquired knowledge and skills in</i></p>	Colombia 03:50PM
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the realm of mechatronics engineering. As active participants in this pedagogical experiment, the student group reflects upon their role as test subjects in evaluating the effectiveness of this innovative learning methodology.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM Speaker: Fernando Martell Chavez Mexico 03:10PM

Title: Work in Progress: Innovation and Technology Management Key Topics for Engineering Graduate Education (Paper # 858)

Authors: Fernando Martell , Irma Y. Sanchez , Gabriel Puron

Abstract *Many developed countries are knowledge-based societies where technological Innovation is one of the main drivers of economic development. Education in Science, Technology, and Engineering contributes to creating an innovation culture. In developing countries, there is an educational gap between innovation and technology development and engineering education because of their high technology dependence and the orientation of engineering education to the support of manufacturing systems. This study identifies key innovation and technology management aspects that should be considered as study topics in engineering programs. These aspects, along with conventional engineering management skills, such as project development and management, entrepreneurship, and financial analysis, are proposed to be incorporated into a two-core course named "Innovation and Technology Management" and "Technology Development." The identified key aspects and course topics are intended for master's and doctoral engineering programs, but they may also be considered for undergraduate engineering programs in all disciplines.*

Presentation time 15 minutos and 5 minutes for Q&A

03:30PM Speaker: Fernando Martell Chavez Mexico 03:30PM

Title: Work in Progress: Applying Learning Energy Efficiency Networks Methodology in an Energy Management Course (Paper # 876)

Authors: Eduardo F. Torres, Fernando Martell, Irma Y. Sanchez

Abstract *Energy management systems serve to implement energy efficiency measures with a systematic approach following a continuous improvement methodology. Energy efficiency networks are organized to help industrial firms collaborate and share experiences in implementing energy improvements to reach energy savings goals. Collaborative learning can also be extended to implementing energy management systems or carrying out energy audits. Learning Energy Efficiency Networks are particularly suitable for small and medium firms to reduce the cost of implementing energy management systems. This work proposes the use of the Learning Network Methodology as an educational tool to be applied in an Energy Management Course with two purposes: one is the collaborative problem-oriented learning of how to implement energy efficiency measures, and second, understanding the learning network methodology itself and its application for energy management. Experiences in the course design and impartation are presented.*

Presentation time 15 minutos and 5 minutes for Q&A



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2:30PM - 4:00PM
Track 4
ONLINE oral presentations livestream on zoom Track 4
Session Manager: Osvaldo Clua



ONLINE English Technical Session #6



Chair: Osvaldo Clua

Crafting Pedagogical Excellence: Presentations on Effective Teaching and Learning Activities

Albania 09:30PM	Argentina 05:30PM	Australia 13 Mar, 06:30AM	Bolivia 04:30PM	Brazil 05:30PM
Canada 01:30PM	Chile 05:30PM	China 13 Mar, 04:30AM	Colombia 03:30PM	Ecuador 03:30PM
Germany 09:30PM	Greece 10:30PM	Honduras 02:30PM	India 13 Mar, 02:00AM	Indonesia 13 Mar, 03:30AM
Ireland 08:30PM	Israel 10:30PM	Japan 13 Mar, 05:30AM	Macao 13 Mar, 04:30AM	Mexico 02:30PM
New Zealand 13 Mar, 09:30AM	Peru 03:30PM	Philippines 13 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
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2:30PM Speaker: **Iris Vaneza Caycho Ñuflo** **USA (EDT) 05:30PM**

Title: **Beyond class activities to involve Women. Fab Lab-Based Learning in Latin America (Paper # 898)**

Authors: Pablo C Herrera, Macarena Valenzuela-Zubiaur, Vaneza Caycho, Cristina Dreifuss-Serrano

Abstract *This quantitative research analyzes the participation of Latin American women graduates in a Fab Lab-based learning environment in the IEEE Region 9, including 176 graduates from 11 countries between 2012 to 2023. We analyzed 20% (N=36) of Women graduates in Latin America in 24 of 303 Fab Labs, and we compared them with 361 Fab Academy graduates from countries of other nine IEEE regions. The results reveal differences, which indicate a lower number of graduates in the Andean sub-region compared to countries of the extreme south of America. This includes only 17% of Women managing a Fab Lab. Latin America demonstrates the lowest percentage of Women graduates and managers compared to other IEEE regions. This longitudinal analysis highlights for future research, beyond the academic issues that contribute to the reduction of the gender gap.*

Presentation time 15 minutos and 5 minutes for Q&A

02:50PM Speaker: **Mónica Huerta** **Ecuador 03:50PM**

Title: **A Scoping Review and Bibliometric Analysis of BBC Micro: Bit Research (Paper # 896)**

Authors: Ronny Cabrera, Andrea Carrión, Mónica Huerta

Abstract *According to UNESCO, the use of technology in education can enhance the quality of education and increase access to education worldwide. One of the technological devices that has gained popularity in education in recent years is the BBC micro:bit. This device has been used as an educational tool to teach programming and technology to students of all ages. As the number of studies grows, it is essential to develop an understanding of the current state and identify prevalent themes and trends shaping the literature. With this goal in mind, this paper combines a scoping review and bibliometric analysis to map and analyze the literature on the implementation of the BBC Micro:bit in primary and*



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secondary education. A total of 274 authors have published 95 documents with an average of 2.88 co-authors per document. The integration of Micro:bit in education has allowed for the adoption of various teaching strategies and methodologies, enriching the learning experience of students. Overall, this study provides a better understanding of the literature on the BBC Micro:bit and its research landscape in an educational context.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM Speaker: Mónica Huerta **Ecuador 04:10PM**

Title: A Scoping Review and Bibliometric Analysis of Strategies to Increase Girls' Motivation in STEM (Paper # 900)

Authors: Andrea Carrión, Ronny Cabrera, Mónica Huerta

Abstract *According to UNESCO, in the world women represent only 35 % of those pursuing higher education studies in STEM. Gender equality is a high-priority global goal that seeks to be addressed effectively. To move in this direction, the implementation of strategies and programs aimed at promoting the inclusion of women, especially girls, in STEM fields has been key. As the number of studies grows, it is essential to develop an understanding of the current state and identify the predominant themes and trends that shape the literature. To this end, this paper combines scoping review and bibliometric analysis to map and analyze the literature on strategies used to motivate women in STEM fields. A total of 338 authors have published 87 documents with an average of 4 co-authors per document. Throughout this documentary analysis, effective pedagogical strategies, as well as gender equity projects and programs, were examined. Additionally, successful experiences, testimonials, and role models that have positively impacted the motivation and engagement of women in STEM fields will be explored. Overall, this study provides a better understanding of the literature on the strategies used to motivate women toward STEM fields.*

Presentation time 15 minutos and 5 minutes for Q&A

03:30PM Speaker: Andres Esteban Acero Lopez **Mexico 03:30PM**

Title: WIP: Intersectionality, competences and engineering: an exploratory study in Tec21 (Paper # 833)

Authors: Isaac Olivas, Andrés Acero, Jorge Gonzalez, Eduardo Caballero, Alejandro Mejia

Abstract *Intersectionality, the convergence of social categories leading to unique forms of oppression, has significant implications, particularly in STEM fields, where factors like gender, race, and social status intersect. However, there is a notable research gap in Latin America regarding the impact of intersectionality on educational achievement. This study focuses on unraveling the intersectionality of social categories among Engineering students at Tecnológico de Monterrey and its influence on academic performance. To achieve this, advanced AI techniques, including hierarchical clustering and K-means clustering, will be employed to discern key characteristics within the student population. Additionally, several regression models will be developed to predict academic grades, considering factors such as race, gender, and socioeconomic background—the elements of our social categorization. Longitudinal data from an Artifact Design Course will be analyzed. This research promises valuable insights into how intersectionality shapes student academic achievement, potentially benefiting educational institutions worldwide.*

Presentation time 15 minutos and 5 minutes for Q&A



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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 13 Mar, 08:00AM	Bolivia 06:00PM	Brazil 07:00PM
Canada 03:00PM	Chile 07:00PM	China 13 Mar, 06:00AM	Colombia 05:00PM	Ecuador 05:00PM
Germany 11:00PM	Greece 13 Mar, 12:00AM	Honduras 04:00PM	India 13 Mar, 03:30AM	Indonesia 13 Mar, 05:00AM
Ireland 10:00PM	Israel 13 Mar, 12:00AM	Japan 13 Mar, 07:00AM	Macao 13 Mar, 06:00AM	Mexico 04:00PM
New Zealand 13 Mar, 11:00AM	Peru 05:00PM	Philippines 13 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 English Technical Session #7

Chair: Carla M. A. Pinto



Exploring the Synergy: Bridging the Gap Between Research and Education

Albania 11:30PM	Argentina 07:30PM	Australia 13 Mar, 08:30AM	Bolivia 06:30PM	Brazil 07:30PM
Canada 03:30PM	Chile 07:30PM	China 13 Mar, 06:30AM	Colombia 05:30PM	Ecuador 05:30PM
Germany 11:30PM	Greece 13 Mar, 12:30AM	Honduras 04:30PM	India 13 Mar, 04:00AM	Indonesia 13 Mar, 05:30AM
Ireland 10:30PM	Israel 13 Mar, 12:30AM	Japan 13 Mar, 07:30AM	Macao 13 Mar, 06:30AM	Mexico 04:30PM
New Zealand 13 Mar, 11:30AM	Peru 05:30PM	Philippines 13 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: Carla M.A. Pinto
Title: Empowering Engineering Students' Math Literacy with Digital Escape Rooms (Paper # 810)
Authors: Carla M.A. Pinto, Christos Nikolopoulos, Mário Cruz, Ricardo Queirós, Konstantinos Petridis
Abstract *This text delves into innovative digital teaching strategies, specifically focusing on Math digital escape rooms (ER), tailored for Engineering students. Part of Erasmus+ initiative, MATH-DIGGER - Mathematics Digital Escape Rooms project aims to revolutionize education. The project's online platform serves as a dynamic arena, challenging students with puzzles and quizzes, within a time constraint, promoting an interactive learning experience. MATH-DIGGER's broader goal extends beyond subject mastery, aiming to enhance students' digital proficiency and cultivate crucial skills(cognitive, social, and psychological), pivotal for future success. This paper highlights the practical implementation of a Differential and Integral Calculus ER, aligning with sustainable development goals, particularly SDG 7: 'Ensure access to affordable, reliable, sustainable, and modern energy for all.' It outlines the necessary steps for a successful digital implementation, combining scientific,*



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gamified, and informatics perspectives. By February 2025, MATH-DIGGER plans to release three completed ER online, furthering its commitment to accessible and engaging education.

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM Speaker: Prateek Shekhar
Title: **Work in Progress: Utilizing Decision Tree Analysis for Engineering Students' GPA Prediction (Paper # 815)**
Authors: Prateek Shekhar, Md Tarique Hasan Khan, Sanjeet Gajjar
Abstract *Students' grade point average (GPA) is an important indicator of students' academic success. In our work-in-progress study, we utilized decision tree analysis to investigate patterns in predicting the GPA of engineering students, considering various demographic, socioeconomic, and academic aspects. Our analysis of the dataset consisting of engineering students' academic records revealed several key insights. First, SAT scores emerged as a central factor in GPA prediction, with higher scores predicting better GPAs. Second, socioeconomic status also became evident among students with high SAT scores, reflecting the impact of background characteristics on academic achievements. Lastly, parent education level also stood out as significant, showing that students with highly educated parents generally achieved higher GPAs, underlining family educational background's role in success. Overall, our research adds to the existing literature by illuminating the intricate factors influencing engineering students' GPA and provides an example of utilizing decision tree-based quantitative methods in engineering education research.*

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM Speaker: Mário Rui Domingues Ferreira da Cruz
Title: **Reconfiguring Teacher Professionalism in Higher Education in Portugal: A Case Study on Pedagogical Innovation and Hybrid Learning (Paper # 824)**
Authors: Mário Cruz, Daniela Mascarenhas, Carla M.A. Pinto, Ricardo Queirós
Abstract *The teaching and learning process in higher education needs continuous cultivation of pedagogical expertise, encompassing subject mastery and pedagogical methodologies. This article explores the transformation of higher education institutions (HEIs) into hybrid campuses and the importance of pedagogical innovation, highlighting the need for training in hybrid/e-learning environments, and emphasizing the potential of mobile technologies. Furthermore, it presents a case study on two professional development courses offered to faculty members, working in the field of Engineering in Portugal, aiming to reconfigure their professionalism. The research adopts an ethnographic methodology, integrating quantitative methods and utilizing a variety of data collection tools, including field notes and self reflection sheets, to analyze the teachers' reconfiguration of their professional practices. The main findings of the study reveal that the majority of faculty members reported significant gains in transforming traditional courses to digital formats, mastering various online platforms and tools, and developing skills in online communication.*

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: Maria Feldgen



ONLINE Spanish Technical Session #3

Chair: Maria Feldgen



Exploring Hybrid Learning: Technology Integration and Adaptation

Albania 11:30PM	Argentina 07:30PM	Australia 13 Mar, 08:30AM	Bolivia 06:30PM	Brazil 07:30PM
Canada 03:30PM	Chile 07:30PM	China 13 Mar, 06:30AM	Colombia 05:30PM	Ecuador 05:30PM
Germany 11:30PM	Greece 13 Mar, 12:30AM	Honduras 04:30PM	India 13 Mar, 04:00AM	Indonesia 13 Mar, 05:30AM
Ireland 10:30PM	Israel 13 Mar, 12:30AM	Japan 13 Mar, 07:30AM	Macao 13 Mar, 06:30AM	Mexico 04:30PM
New Zealand 13 Mar, 11:30AM	Peru 05:30PM	Philippines 13 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
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4:30PM Speaker: Julio Ricardo Martínez Montezuma **Colombia 05:30PM**
Title: Generative Artificial Intelligence Impact on Education and Industry: An Ethical Dimension (Paper # 879)
Authors: Julio Ricardo Martínez Montezuma, Mario Chong
Abstract *This research stresses the importance of ethics in addressing ethical challenges and serving as a crucial guide in industry and education. It is recommended that organizations integrate ethical principles into their guiding documents and encourage ethical reflection among students. Ethics plays a crucial role in the generative artificial intelligence (GAI) responsible application for the benefit of society. The ethics use is essential in weighing up GAI's strengths and weaknesses.*

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM Speaker: Pedro Freddy Huamani Navarrete **Peru 05:50PM**
Title: Design of rubrics for the evaluation of research work in the Capstone Project subject of an Electronic Engineering Program (Paper # 910)
Author: Pedro Huamani
Abstract *This article presents the design of eight rubrics aimed at progressively assessing research work in a Capstone Project course, aiming to increase the number of thesis projects in the Electronic Engineering program at Ricardo Palma University, due to the limited number of defended theses. These rubrics focused on evaluating the progress of the final report writing and the presentation of the implementation, operation, and/or simulation in software and/or hardware of the research work, whether in industrial, commercial, or other applications. Indicators such as oral presentation, achievement of objectives, engineering standards, limitations, grammar, among others, were considered. Likewise, this design used the university's own pedagogical model to contribute to the direct measurement of student outcomes, when the program was evaluated by two accreditation agencies. As a result of the use of the rubrics, students obtained an average grade with a positive trend in the last four years.*

Presentation time 15 minutos and 5 minutes for Q&A



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TUESDAY, March 12, 2024

05:10PM Speaker: Renzo Burga Pastor Peru 06:10PM

Title: Model for the selection of virtual educational tools in university leveling cycles in engineering using AHP (Paper # 894)

Authors: Hugo Flor-Cunza, Renzo Burga-Pastor, Juan Lara-Herrera

Abstract *The need for engineering students to be able to use new learning mechanisms drives engineering teachers to make applications based on efficient procedures, due to the emerging alternatives of virtual tools (VT), which is why it is applied AHP, to analyze and support the need to evolve to university leveling cycles in engineering programs, and thus obtain more competitive tools to obtain better career experiences. For this, four criteria have been used: Relationship and adaptation, Optimization of dynamics, Personalized control, and Promotion of competitiveness; These have been validated by experts in relevant areas of education and engineering. The result shows that the most appropriate criterion is the fourth, closely followed by the first. However, the other two criteria show considerable differences, which are detailed in this work and allow a contrast to be made about what the universities offer our country in engineering programs.*

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM Speaker: Juan Lara-Herrera Peru 06:30PM

Title: Use of Artificial Intelligence in Electronic Engineering students of Research Program III (Paper # 881)

Authors: Juan Lara-Herrera, Luis Romero-Untiveros, Hugo Flor-Cunza

Abstract *This research seeks to establish a review of the organized and guided use of the various platforms that operate with artificial intelligence, applied to university students of the last cycles with the aim of being able to have an additional tool as part of their development process of their thesis works and research projects. With this premise, two groups have been compared: one controlled and the other experimental, in which a very marked distinction has been made between both groups, and with this contrast a general hypothesis in which we assume that AI is good in education as long as it is within an accompaniment so that this also strengthens its ethical principles and is not used indiscriminately. Likewise, to establish a guideline that will allow us to continue with research topics based on our context, but using the treatment of information in a responsible way.*

Presentation time 15 minutos and 5 minutes for Q&A



Empowering Engineering Education: Breaking barriers through research and innovation

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4:30PM - 6:00PM
Track 3
ONLINE oral presentations livestream on zoom Track 3
Session Manager: Ana Luna



ONLINE Spanish Technical Session #4



Chair: Mario Chong

Advancing Education: Exploring Innovative Learning Technologies and Ethical Considerations

Albania 11:30PM	Argentina 07:30PM	Australia 13 Mar, 08:30AM	Bolivia 06:30PM	Brazil 07:30PM
Canada 03:30PM	Chile 07:30PM	China 13 Mar, 06:30AM	Colombia 05:30PM	Ecuador 05:30PM
Germany 11:30PM	Greece 13 Mar, 12:30AM	Honduras 04:30PM	India 13 Mar, 04:00AM	Indonesia 13 Mar, 05:30AM
Ireland 10:30PM	Israel 13 Mar, 12:30AM	Japan 13 Mar, 07:30AM	Macao 13 Mar, 06:30AM	Mexico 04:30PM
New Zealand 13 Mar, 11:30AM	Peru 05:30PM	Philippines 13 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	<p>Speakers: Agatha Da Silva Ovando, Ana Luna, Mario Chong</p> <p>Title: Challenges for education in the new era: education and training in Industry 5.0 roles (Paper # 895)</p> <p>Authors: Ana Luna, Mario Chong, Agatha Da Silva Ovando</p> <p>Abstract <i>This exploratory research presents the new Industry 5.0 challenges, the progressive industrial revolution differences and the main education and training roles. The theory will be presented to justify the program development are: adoption stages, barriers and facilitators, pedagogical shift, student engagement and outcomes, and sustainability and scalability. The results suggest pedagogical transformations such as onmidigital education and ICT. F. Therefore, rethinking the Education 5.0 role, understanding when and why occurs considering the past, people's expectations, and oriented the new generations</i></p> <p style="text-align: center;"><i>Presentation time 15 minutos and 5 minutes for Q&A</i></p>	Peru 05:30PM
04:50PM	<p>Speaker: Antony De La Cruz Vasquez</p> <p>Title: Selection of the most influential ICT to improve the development of teaching in Peru using AHP methodology (Paper # 882)</p> <p>Authors: Hugo Flor-Cunza, Antony De-La-Cruz-Vasquez, Juan Lara-Herrera</p> <p>Abstract <i>Technological advances and the different tools they provide, an exhaustive search is carried out to achieve improvements in teaching for the education sector in Peru. To find an objective and relevant approach to identify the most influential ICT to generate a better educational development. In this article an arduous study is carried out to select the most influential ICT using the Analytic Hierarchical Process (AHP) method. Four information and communication technologies were proposed and compared: digital platforms, educational applications, robotics and virtual reality. These technologies were ranked according to key criteria, such as accessibility, development, interaction and integration. The final selection was made by applying the AHP methodology, with the active participation of four experts in the field. The results obtained revealed that the best ICT for improving teaching development are digital platforms.</i></p>	Peru 05:50PM



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Presentation time 15 minutos and 5 minutes for Q&A

05:10PM Speaker: Eduardo Guillermo Pinos Velez Ecuador 06:10PM

Title: Bioethics for Engineering Research (Paper # 909)

Authors: Eduardo Pinos-Velez, Maria del Cisne Ortega-Cabrera, David Farfan-Tello, Juan Gonzales-Loja

Abstract *This research is based on the bioethical protocols used in the field of engineering, especially in electronic and biomedical engineering, it analyses the ethical principles and parameters that should be used in research, at the same time it shows the type of research that is carried out, its risks, population and the standards that must be met to be an ethical research and suitable for living human beings. It is about being professional but also human, taking necessary risks that are known to be of benefit to the research subject and to other people, as long as the research subject agrees to be part of the research and proves what is said by signing a document called informed consent, which states the purpose, the risk and the detailed procedure of what will be done in the research*

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM Speaker: Jose Luis Ordoñez-Fernandez Honduras 05:30PM

Title: Work in Progress: A Proposed Method for Mechanical Engineering Students with CAD Simulations for Real Machines (Paper # 835)

Author: Jose Luis Ordoñez-Fernandez

Abstract *The aim of this work is to develop a working method so that students can acquire the skills for working with machines. This work proposes the use of machines built by students as a starting point for generating learning competencies based on reverse engineering. The three-dimensional (3D) image of the plastic injection molding machine designed by the students shows key elements, such as the auger and plastic part molds. This visualization represents the first stage of the process, where theoretical knowledge of computer-aided design (CAD) is applied to create the design. The kinematics of the machine is obtained, allowing a detailed analysis of its operation and movements. Temperature measurements are also taken at several critical parts of the injection process, including product temperatures in the molds, ejection temperatures, and screw temperatures. A thorough evaluation of the options available on the market was carried out, considering aspects such as performance, compatibility, and ease of integration.*

Presentation time 15 minutos and 5 minutes for Q&A



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TUESDAY, March 12, 2024

8:00PM - 10:00PM



IN PERSON Banquet

Albania 13 Mar, 03:00AM	Argentina 11:00PM	Australia 13 Mar, 12:00PM	Bolivia 10:00PM	Brazil 11:00PM
Canada 07:00PM	Chile 11:00PM	China 13 Mar, 10:00AM	Colombia 09:00PM	Ecuador 09:00PM
Germany 13 Mar, 03:00AM	Greece 13 Mar, 04:00AM	Honduras 08:00PM	India 13 Mar, 07:30AM	Indonesia 13 Mar, 09:00AM
Ireland 13 Mar, 02:00AM	Israel 13 Mar, 04:00AM	Japan 13 Mar, 11:00AM	Macao 13 Mar, 10:00AM	Mexico 08:00PM
New Zealand 13 Mar, 03:00PM	Peru 09:00PM	Philippines 13 Mar, 10:00AM	Poland 13 Mar, 03:00AM	Portugal 13 Mar, 02:00AM
Puerto_Rico 10:00PM	Senegal 13 Mar, 02:00AM	Spain 13 Mar, 03:00AM	Tunisia 13 Mar, 03:00AM	United Kingdom 13 Mar, 02:00AM
USA (CDT) 10:00PM	USA (PDT) 08:00PM	USA (EDT) 11:00PM		

Local Time **Presentation**

8:00PM Summary: *Farwell dinner is a way to close the successful event accompanied by the colleagues in a nice and beautiful environment. The tickets will be available at the reception desk.*