

2021 World Engineering Education Forum/Global Engineering Deans Council (WEEF/GEDC 2021)

**Madrid, Spain
15 – 18 November 2021**



**IEEE Catalog Number: CFP21Q68-POD
ISBN: 978-1-6654-2489-9**

**Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP21Q68-POD
ISBN (Print-On-Demand):	978-1-6654-2489-9
ISBN (Online):	978-1-6654-2488-2

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Title	Page range
Building Conceptual Models and Engineering Design Thinking in K-12 Students	1–7
Role of Indian Higher Education towards Aatmanirbhar India: Government Policies and Initiatives to promote Entrepreneurship and Innovation	8–14
Transformation in Course Delivery Augmented with Problem-Based Learning and Tutorial	15–22
The Grand Challenges Scholars Program, 12 years later. A new vision for the development of Trustworthy Engineers	23–28
Transition of Engineering Education During the COVID-19 Pandemic	29–35
Characterization of the space and process of knowledge production in technological development projects with social impact	36–43
Of Marbles and Minecraft: Designing STEM Educational Games for Culturally Diverse Young Learners in Malaysia	44–49
Online engineering tutorials: Investigation into tutors' use of technologies for learning	50–58
Beyond Experts and Conciliators: Envisioning Engineers as Multifaceted Peacebuilders in Costa Rica	59–68
Affordable and Reliable Power and Communication Device for Continuous Online Learning for African Students	69–75
New Approach in Design Education for Additive Manufacturing using RC Race Car Models	76–81
Developing Sustainable, Mutually Collaborative, Global Partnerships	82–87
Impact of Blended Learning on Engineering Students Attendance Post COVID-19	88–94
Enhancing system development learning by applying Real Time Operating System concepts through connecting courses	95–100
Time for mentally healthy engineering students	101–109
Educational Pyramids Aligned: Bloom's Taxonomy, the DigCompEdu Framework and Instructional Designs	110–117
Using Online and Blended Learning Method for Teaching Novices in Mobile Application Development	118–123
A decade of chemical engineering graduates: their roles and skills in the world of work	124–131
Perceptions on online video tutorials for perceived difficult assignments in a Bachelor of Engineering Technology in Electrical Engineering subject at an African	132–137
Putting the "Peace" in Peace Engineering: The Carter School Approach	138–143
Learning Environment - What Matters for the High Ability Computer Science Students?	144–152
'Engineering for Global Development' in Academic Institutions: An Initial Review of Learning Opportunities Across Four Global Regions	153–158
Real Engineering Problems in an Undergraduate Course: The learning methodologies and assessment tools	159–168
Assessment of Adaptation of E-learning in Engineering Education in Nigeria Universities	169–176
Evaluation of engineering students output during covid-19 pandemic lockdown	177–182
How women experience peer-to-peer learning model - a case study of an IT school in Russia.	183–189
Design of a Multi-axis Prosthetic foot for the amputees in the developing world based on human's foot bones structure for Sudanese environment	190–195
Setting up an authentic learning environment using hybrid approach for transformative learning experience: Experiences from a Field Exercise Course in Higher	196–204
Arduino-based water analysis pocket lab	205–210
Analyzing the future Engineering Education in Europe: First evidence from six European countries	211–216
The shift to online and blended learning at an engineering school: feedback and results	217–223
Promoting Critical and Design Thinking Activities to Tackle Sustainable Development Goals in Higher Education	224–230
Gender Distribution in Academic Leadership: An Exploratory Study of Top Universities of Bangladesh	231–240
Enablers and Barriers to Implementing Service-Learning in India – A Case-Study of Two Service-learning Models Integrated into Undergraduate Engineering	241–249
Developing a mentorship programme for 1st year engineering students : A case study on how the programme was developed and implemented	250–259
Re-think assessment methods for Engineering Technology Programmes: A case study in Mechanical Engineering Technology	260–269
On the ABET accreditation of academic programs and rankings of universities in Saudi Arabia	270–276
Economy-Development-Sustainability: Conciliatory Visions towards an Environmentally Ethical Engineering Education	277–284
Required Competence Development in Higher Education to Manage the Digital Transformation in the Industry	285–290
A Hybrid Model for the Undergraduate laboratory Course in Analog Electronics amid the COVID-19 Pandemic Challenges	291–296
An Experience of Transition From In-Person Mode of Delivery to Online Mode In A First-Year Engineering Course	297–303
A blended learning framework for delivery of Laboratory Course in Digital Circuits during COVID-19 pandemic	304–309
A cumulative learning approach to developing scholarship of teaching and learning in an engineering community of practice	310–318
Project Progress Monitoring and Assessment at Engineering Undergraduate Level during Covid 19 Pandemic - Challenges and Solution	319–324
Professional development support for women engineering faculty with Lean In Circles	325–332
Scholarship of Teaching and Learning - A way to identify inclusion opportunities and exclusion risks in digital learning scenarios	333–339
Organizing for Capacity and Involvement Among Faculty, Students and Staff in Engineering Education Change – 10 Years of Development	340–348
MATILDA Latin American Open Chair, an international cooperation initiative for more women in engineering	349–355
Evaluation of Engineering Ethics in a Mechanical Engineering Curriculum at a Caribbean National University	356–361
Women's motivation to mentor young women students in STEM areas: A Study Case in Mexico	362–368
Decolonial Ethics in Training in Computational Engineering. A Qualitative Study of Professors' and Students' Perspectives	369–374
Exploring the concept of Computational Thinking in STEM Education	375–380

Table of Contents

Title	Page range
Project Based Learning to Enhance Employability and Enterpreneurship: A Collaborative Approach	381–386
Addressing the need for online engineering labs for developing countries	387–396
A High School Engineering Curriculum Focusing on Discovery, Design, Professional Skills and Society	397–404
A competency-based model to integrate sustainability in curricula in French universities and engineering schools	405–411
An innovative approach to provide continuing education for industry employees at undergraduate level of engineering	412–419
Experiential learning methodology adopted for effective delivery of Computer Communication Networks course during Covid-19 pandemic	420–425
Sustainable Development in Engineering Education	426–431
From the execution of transformation frameworks to the development of education strategies in organizations	432–440
Leveraging a EAST -WEST partnership to broaden participation of URM Faculty	441–446
PROF-XXI: Teaching and Learning Centers to Support the 21st Century Professor	447–454
Creating a Project track in a 5-year integrated Engineering Curriculum	455–460
GAMIFICATION METHOD TO IMPROVE SPEECH SKILLS AND PROFICIENCY AMONG STUDENTS: METHODOLOGY FOR IMPLEMENTATION	461–467
A comprehensive VISIR bibliographical reference	468–475
Consuming Security: Evaluating Podcasts to Promote Online Learning Integrated with Everyday Life	476–481
VISIR Technical Enhancements to Improve Educational Support	482–487
Educational Innovation: Focusing on enhancing the skills of Generation Z workforce in STEM	488–495
Soft skills for the development of social and sustainable projects in industrial engineering students	496–499
Automated code evaluation of computer programming sessions with MATLAB Grader	500–505
Effective Gamification: A Guideline for Gamification Workshop of WEEF-GEDC 2021 Madrid Conference	506–510
The Global Society of Peace Engineers – advocating for the profession	511–517
Preparing Engineers for Lifelong Learning in the Era of Industry 4.0	518–523
Mapping VISIR Circuits for Computer-assisted Assessment	524–527
Fostering integrative thinking through an online AR-based robot system analysis	N/A
Inducing decentralized monitoring and support of academic activities driven by community and digital resources: the case of the Science and Technology	537–541
Strengthening University Computing Programs to Meet National Security Needs	542–544
Resources and new educational modules for Sustainable Financial Literacy	545–549
Online Laboratory Communication Using MQTT IoT Standard	550–555
Teaching Programming with a Limited Infrastructure	556–562
Overcoming the Gap of Social Presence in Online Learning Communities at University	563–570
How do we teach in Engineering? Educational Paradigms and Teaching Strategies for University Educators	571–577
Students' perception about using VISIR	578–583
Description, Analysis and Characterization of VISIR System Toward Extending its Use to Various Fields of Experimenting	584–593
Remote teaching of electrical circuits: proposal for the use of online laboratories in Secondary Education	594–600
E-Engineering for Middle East and North Africa (MENA): Why and How	601–606
Towards leveraging conversational agents for instructors and learners to find and access learning resources	607–611
Remote Microelectronics Experimentation based on VISIR Remote Laboratory: An Approach to Spread VISIR Functionalities Adapted to Hardware Limitations	612–616
How Suitable is for Learners an Autonomous, Interactive and Dynamic Learning Model?	617–623
YachaY for a really flexible and personalized learning in higher education	624–631
Virtual Instrument Systems in Reality (VISIR) in Latin America from a bibliometric perspective: looking back to plan ahead	632–636