



## eLearning & Engineering at EDUCON

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*22-11-2017*

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IEEE  
**EDUCON**  
Global Engineering Education Conference

● 17-20 April 2018, Santa Cruz de Tenerife,  
Canary Islands, Spain

EDUCON 2018 - 17-20 April 2018 - Canary Islands, Spain

TENERIFE

## Educating Our Future, Honoring Our History

26 September 2017

As part of an ongoing effort to improve the quality and impact of the IEEE Education Society sponsored [Frontiers in Education conference](#), the [FIE Steering Committee](#) is actively exploring the conference's

## Upcoming Conferences



**2018 IEEE Frontiers in Education Conference (FIE)**

Initial Submission Deadline: 5  
February 2018

  
Search

## Announcements

Announced: 22 October 2017

▶ [Letter from the President](#)

Announced: 26 September 2017

▶ [Educating Our Future,  
Honoring Our History](#)

Announced: 3 June 2017

▶ [2017 Election Results](#)

## Publications

IEEE TRANSACTIONS ON

**EDUCATION**

A PUBLICATION OF THE IEEE EDUCATION SOCIETY



<http://ieee-edusociety.org/>



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## Open Education and OERs Repositories

Learn how open education and open educational resources (OERs) are changing the rules of education and how to apply them to your everyday teaching.



<http://ieee-edusociety.org/>



**EDUCON2018** 17-20 April, 2018, Santa Cruz de Tenerife, Canary Islands, Spain

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# EDUCON2018 – IEEE Global Engineering Education Conference

Emerging Trends and Challenges of Engineering Education

## Date and Venue

IEEE EDUCON 2018 will be organized by the University of La Laguna, University de Vigo and National University of Distance Education, Spain. The event will be held in Santa Cruz de Tenerife, Canary Islands, Spain, April 18-20, 2018. Several pre-conference workshops will be held on April 17, 2018.

## Theme

"Emerging Trends and Challenges of Engineering Education"

### Supported by



### Important Dates

– Abstract submission for main

<http://www.educon-conference.org>

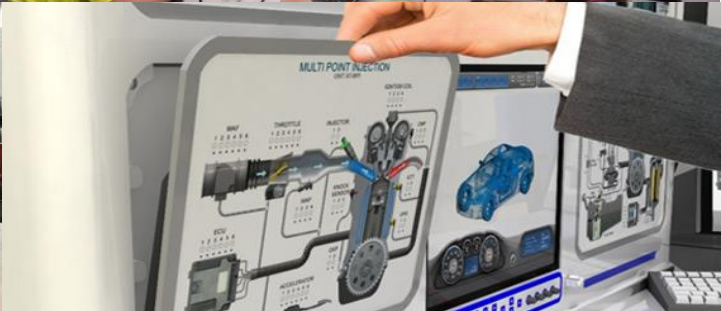
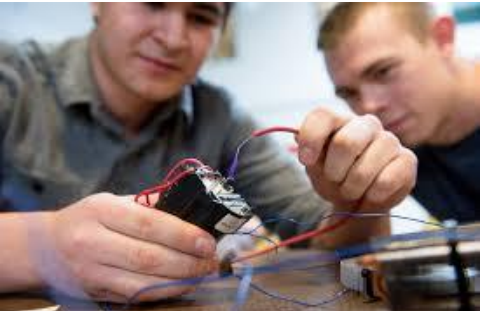
## Emerging Trends and Challenges

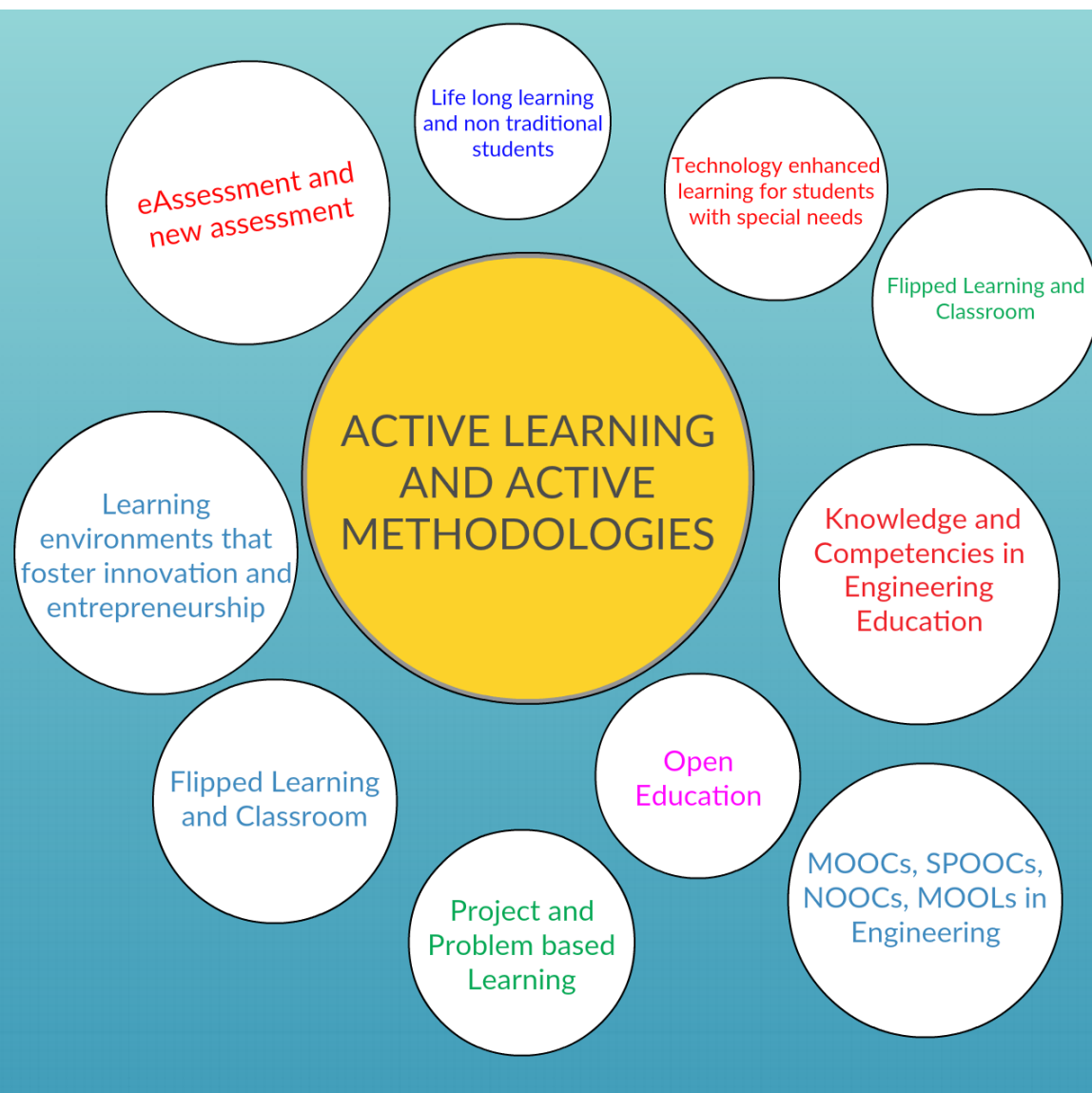
1. Infrastructure and Technologies for Engineering Education
2. Innovation, Methods, Teaching and Learning
3. Attracting, Engaging and Retaining Human Talent to Engineering
4. Serious Games, Game-Based Learning and Gamification for Engineering
5. Virtual and Remote Labs in Engineering Education





Mining  
Architectures  
Federated Data  
computing Analytics  
Technologies Open cloud  
Mobile work Intelligent  
Web Education Ubiquitous  
Source  
Wireless  
**Learning**  
Standardization  
Platforms virtual Standards  
Ontologies Semantic  
Networking Issues reusability  
interoperability  
**Systems**  
Collaborative

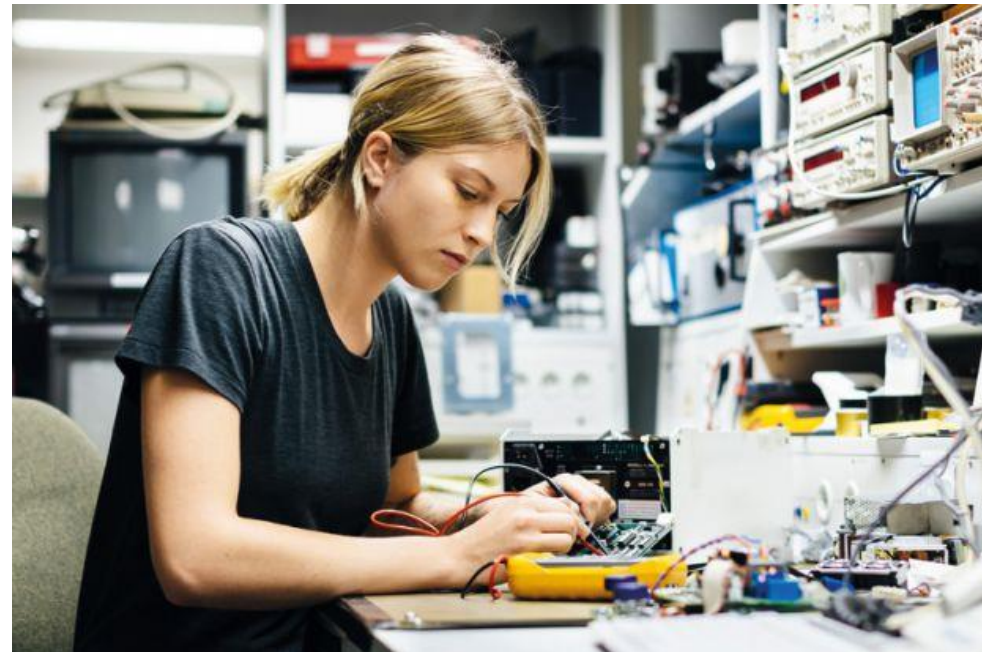






# Attracting, Engaging and Retaining Human Talent to Engineering

Competences  
 attraction  
 Programs Frameworks  
 individual differences  
 Laboratories  
 Innovative  
 Competitions Graduate intervention  
 Preparing Faculty  
**Engineering**  
 Students STEAM  
 Globalization  
 Attracting promotion Curricula  
 practices Gender  
 retaining New  
 STEM minorities  
 E-assessment  
**Education**





# Serious Games, Game-Based Learning and Gamification for Engineering Education

frameworks  
tools  
Methodologies Learning  
tool  
Gamification  
professional  
Games  
Toys Intelligent Serious  
certification engineering  
credentials Enhanced  
Digital recruiting  
accreditation



# Virtual and Remote Labs (V&RL) in Engineering Education

competences  
Implementation  
Industry MOOLs  
reality Physical inside Platforms  
eHealth Things systems maintenance  
Standardization LMSs immersive  
management **V&RL** MOOCs  
Cyber education Internet operation  
worlds Integration Augmented  
Standards big **Learning**  
Smart data Practical  
analytics



# Virtual and Remote Labs (V&RL) in Engineering Education

Laboratorio virtual Grado en Ing Informática

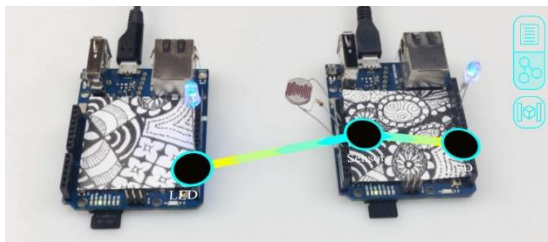


<http://unilabs.dia.uned.es/>



RemoteLab

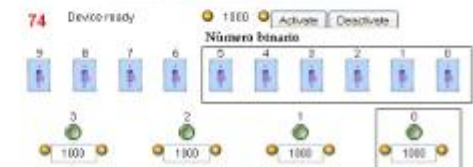
<https://remotelab.ap.polyu.edu.hk/>



OpenHybrid.org:  
<https://vimeo.com/13>:



Show experiments  
Logout



Australian Government  
Department of Education

FarLabs

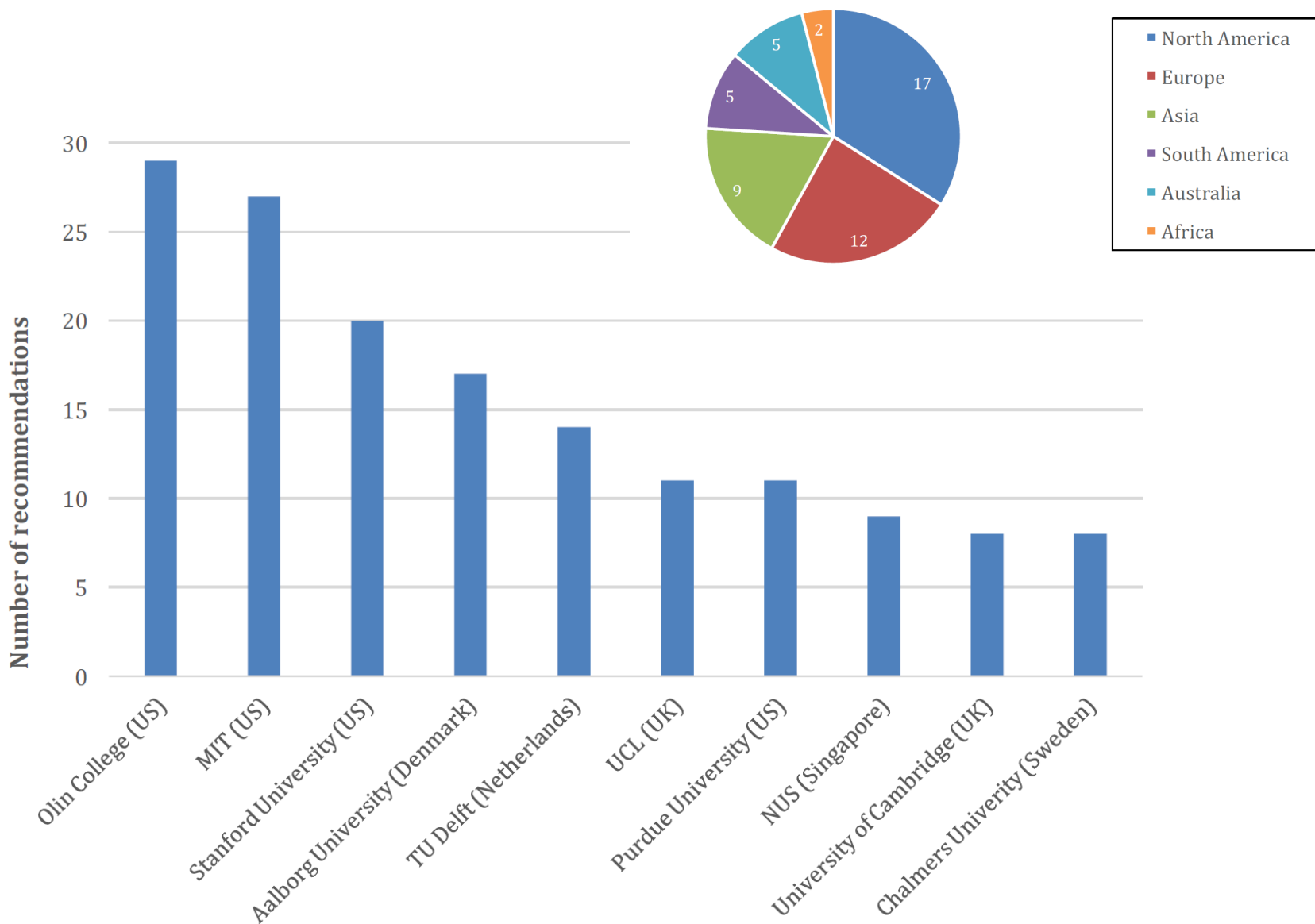
Freely Accessible Remote Laboratories

<https://www.farlabs.edu.au/>



# eLearning & Engineering Education

- **Studying Engineering online is possible now but is not yet widespread;**
- **Quality of online engineering courses** must be comparable or better than face to face courses and **some competences can be augmented by online methods.**
- Engineering education has special needs when offered in a distance mode, including consideration of how to **provide hands on experiences:**
  - Laboratories are a mainstay of engineering education, as are mathematical foundations and design tools -> solved by **Virtual /Remote hands-on Labs & Home labs based on Arduino**
  - Some materials requires significant use of mathematics, so is not as easy to implement as topics that require only text-based discussion -> solved by **Note digital tablets**
  - Design tools (i.e. CAD) often require computing power and graphics that are not always readily available in distributed networked environments -> solved by **online CAD & cloud CAD**



## The 10 institutions most frequently identified as current leaders in engineering education

Graham R. (2017). The global state-of-the-art in engineering education.

URL: <https://www.cti-commission.fr/wp-content/uploads/2017/10/Phase-1-engineering-education-benchmarking-study-2017.pdf>

## Common features of the ‘current leaders’

- *Established international profile*
- *External engagement and educational collaborations*
- **Common Pedagogical features**



# Common pedagogical features of the ‘current leaders’

- **Pathways** and linkages for students to engage with the university’s research activities;
- Long-standing **partnerships with industry**
- A wide range of **technology-based extra-curricular activities and experiences** available to students;
- Multiple opportunities for **hands-on, experiential learning** throughout the curriculum, often focusing on “*problem identification as well as problem solution*”, and typically supported by **maker spaces and team working areas**;
- The application of **user-centred design throughout the curriculum**, often linked to the development of students’ **entrepreneurial capabilities** and/or engaged with the **social responsibility agenda**;
- **Emerging capabilities in online learning and blended learning**;

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