



266632 Bi-National Laboratory on Smart Sustainable Energy Management and Technology Training

Blockchain potentials in education and open science



María Soledad Ramírez, Project leader
Barcelona, June 26, 2018



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Colaboran:





Topics

- Objectives in the framework of open projects
- MOOCs and Blockchain
- Openenergy Network & UNESCO and ICDE Chairs: Open educational movement for Latin America and Blockchain
- Possibilities and challenges



Topics

- **Objectives in the framework of open projects**
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Objectives of the binational project

Support the **formation of human resources specialized in energy sustainability**, and develop human talent with the necessary capabilities to respond to the technological conditions prevailing in the energy value chain (Electric sector), through **graduate programs, massive open online courses and networking** that will be available nationwide, and validate through competencies certification processes.



Web page <http://energialab.tec.mx/>

LABORATORIO BINACIONAL
PARA LA GESTIÓN INTELIGENTE DE
LA SUSTENTABILIDAD ENERGÉTICA Y
LA FORMACIÓN TECNOLÓGICA

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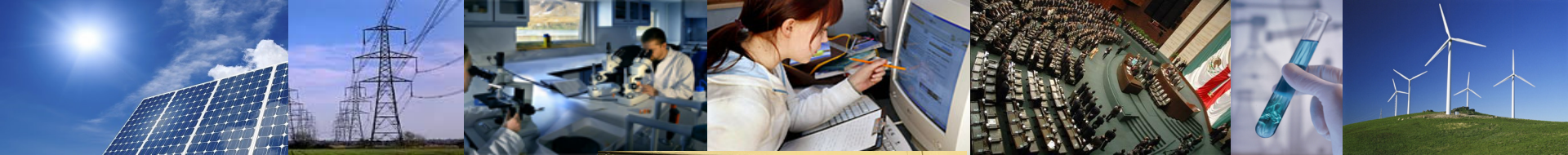


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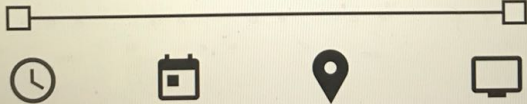


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LA ESCUELA DE HUMANIDADES Y EDUCACIÓN SE COMPLACE EN INVITARTE A LA CONFERENCIA

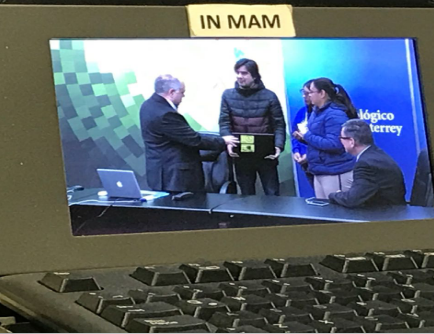
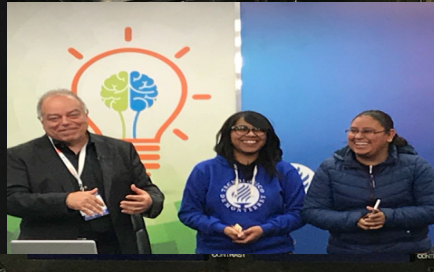
"BLOCKCHAINS EN EDUCACIÓN"



16:30 p. m. 13 de diciembre Sala 2 del piso 1 www.tecvirtual.mx
 Hora del centro de México Canal de transmisión 2

DR. ANTONIO R. BARTOLOMÉ PINA

CATEDRÁTICO DE MEDIOS DIGITALES EN EDUCACIÓN Y DIRECTOR DEL INSTITUTO DE INVESTIGACIÓN EN EDUCACIÓN DE LA UNIVERSIDAD DE BARCELONA



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Colaboran:



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- Possibilities and challenges



MOOC Design and Teaching Time line

2016	2017		2018	2019	
Phase 1	Phase 2	Phase 3	P4	P5	P6
<ul style="list-style-type: none"> 4 MOOC design 	<ul style="list-style-type: none"> 4 MOOC design 4 MOOC teaching 	<ul style="list-style-type: none"> 4 MOOC design 8 MOOC teaching 	<ul style="list-style-type: none"> 12 MOOC teaching 		



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Colaboran:





MOOCs team

Energy experts

- Research Group on Energy and Climate Change
- School of Engineering and Sciences
- Business School
- Expert Guests

23

Educational Innovation experts

- School of Humanities and Education
- Graduate students

11

Teaching and Learning experts

- eLearning team
- Teaching team

22

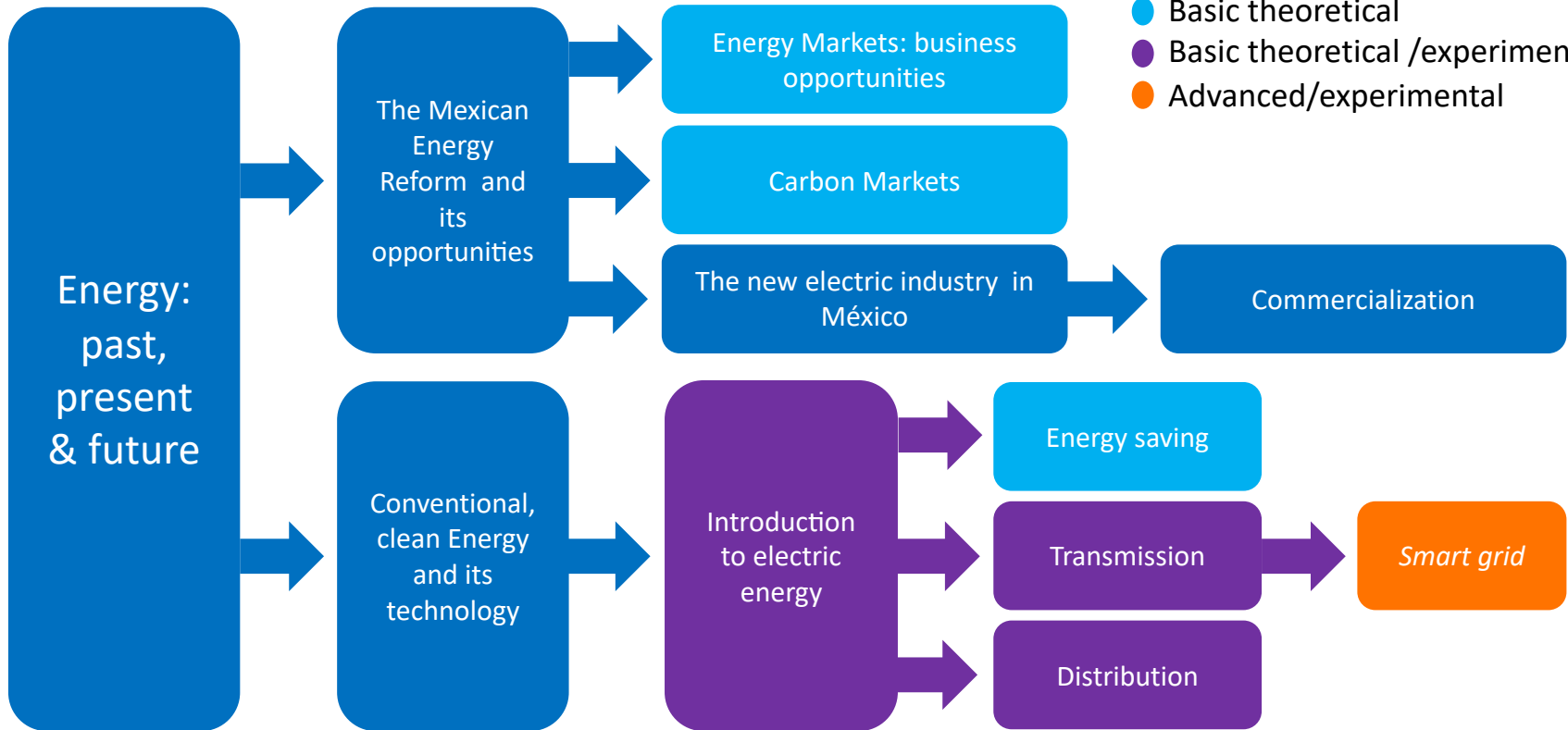


Colaboran:



MOOCs sequence

- General knowledge
- Basic theoretical
- Basic theoretical /experimental
- Advanced/experimental



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Colaboran:



Learners' profile

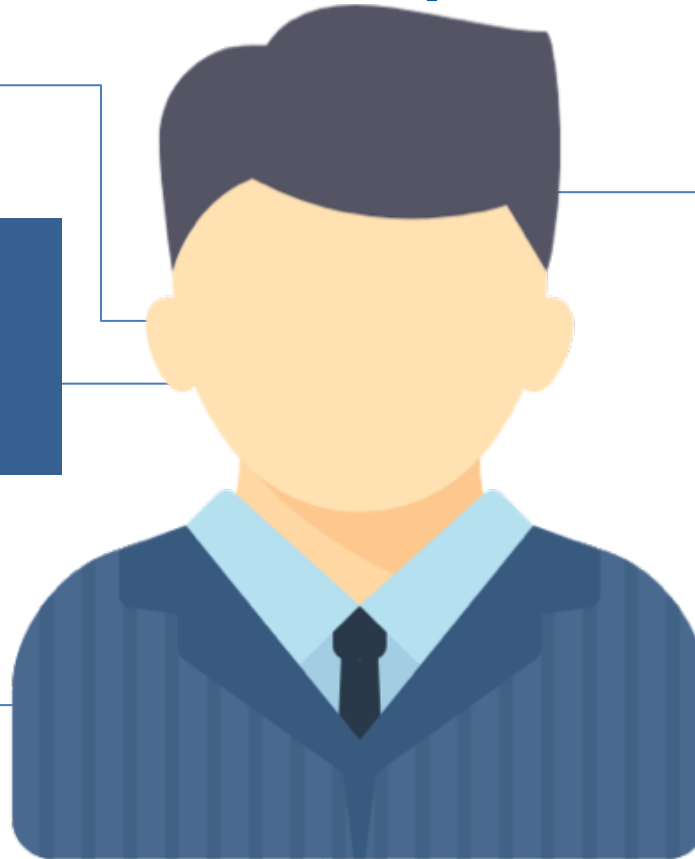
+ 17 years old

+ High school

Wants to learn about energy sustainability

Chooses xMOOC as a training program to achieve learning goals

CFE or industry related employees



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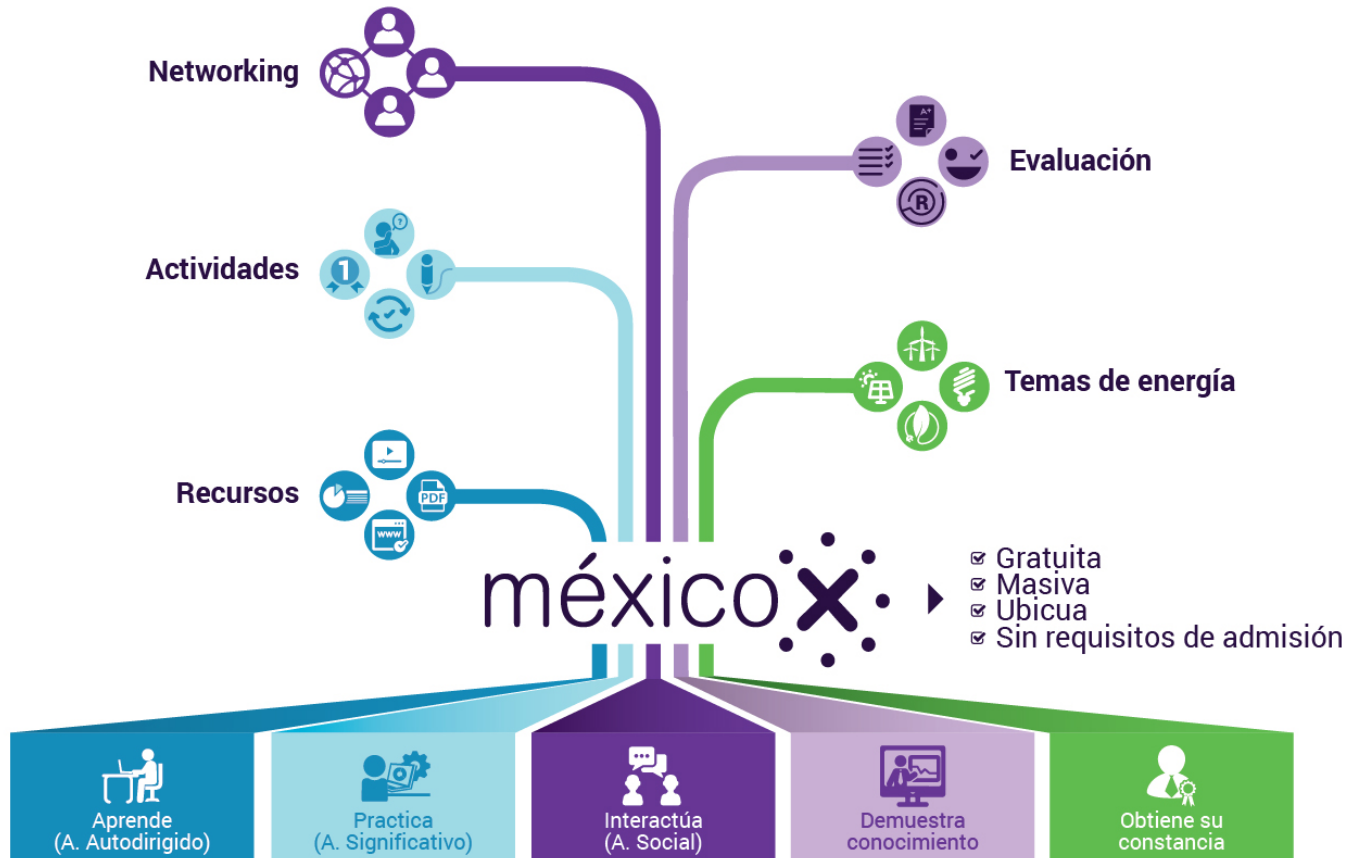
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Colaboran:



Instructional model



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Colaboran:



Educational innovation elements



Gamification

- A question is presented to learners about the content they have studied.
- Badges are assigned to learners that solve the question based on how many opportunities and how long it took them to finish the exercise.

Usuario	Tiempo en contestar	Número de intento	Insignia
Usuario_1	00:01:23	1	
Usuario_2	00:02:01	2	
Usuario_3	00:12:45	3	



Educational innovation elements



Virtual reality

- The use of this type of resources allows learners to interact with concepts and promotes active learning.
- The resources are selected on how they best support the learning experience.





Educational innovation elements



Augmented reality

- The use of this type of resources allows learners to interact with concepts and promotes active learning.
- The resources are selected on how they best support the learning experience.



[52776991] / zhuda / Shutterstock

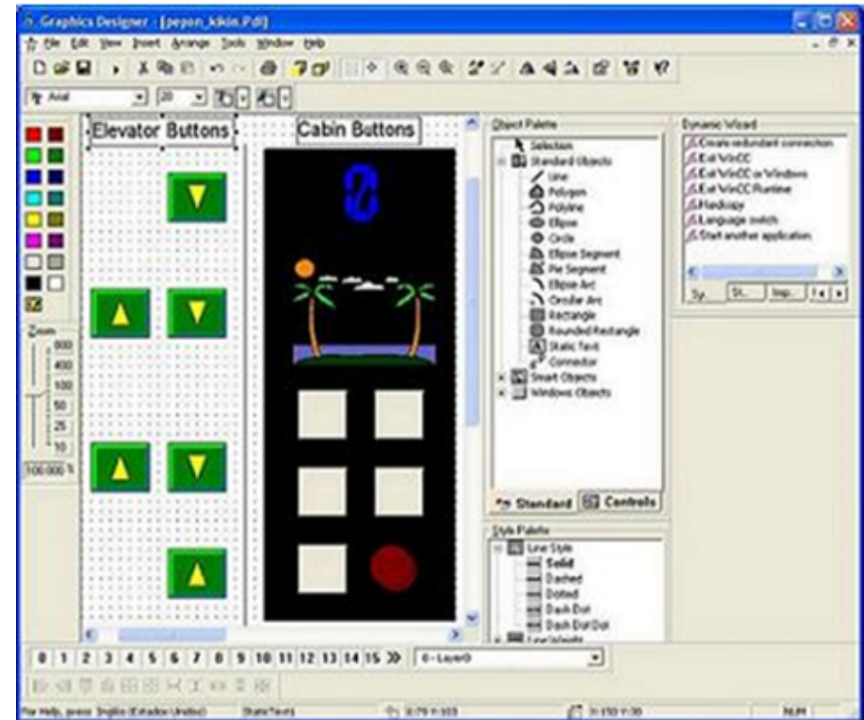


Educational innovation elements



Remote lab

- Learners access the remote lab based at Tecnológico de Monterrey and complete several exercises to practice the concepts they have reviewed in the MOOC.
- There is a limited number of seats, so students have to make a reservation beforehand.



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Colaboran:



Educational innovation elements

Biometrics

- MOOCs are delivered on MexicoX Platform, which is provided by the Mexican government.
- To this date the platform does not offer the use of biometrics, so this functionality will be tested using an external provider.





Open Educational Resources

MOOC

OER

Conventional & Clean Energy and its Technology

<http://temoa.info/es/node/768242>

Energy: past, present & future

<http://temoa.info/es/node/768241>

The Mexican Energy Reform and its opportunities

<http://temoa.info/es/node/768430>

The new electric industry in México

<http://temoa.info/es/node/768244>

Electric power: concepts and basic principles

<http://temoa.info/es/node/768524>

Energy saving

<http://temoa.info/es/node/768499>

Carbon markets: a way to mitigate climate change

<http://temoa.info/es/node/768527>

Energy markets: business opportunities

<http://temoa.info/es/node/768506>

Electric power transmission

<http://temoa.info/es/node/776262>

Distribution of electrical energy

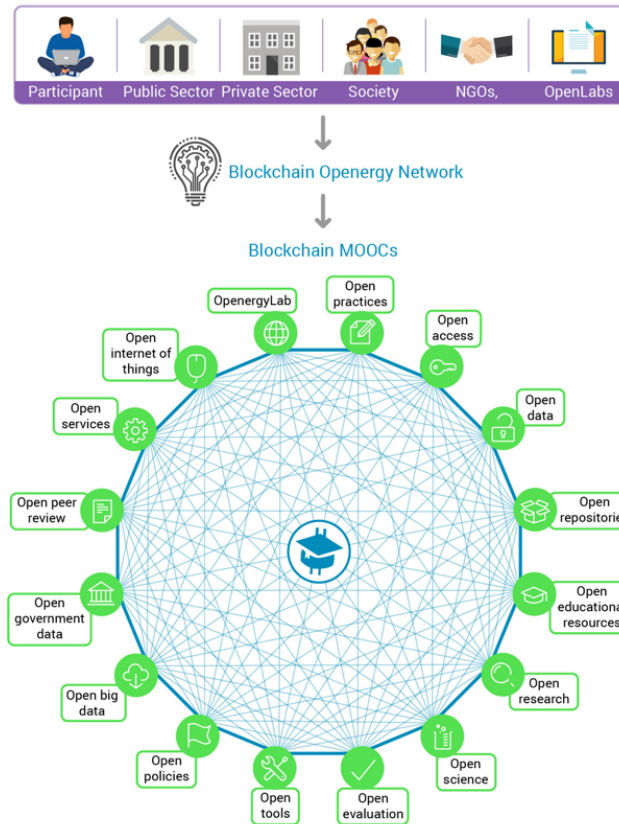
<http://temoa.info/es/node/776644>



Colaboran:



MOOCs and Blockchain



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Colaboran:



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Activities

Training

To foster the training of the members of the network through virtual conferences in order to contribute to the development of innovation and energy sustainability education.

Research

To promote studies on energy sustainability, on the basis of a systematic analysis of research networks that have presence on web pages, papers or blogs, in order to define the nature of the Openenergy network to investigate, spread information and knowledge about education and open innovation for energy sustainability.



Knowledge transfer

To analyze susceptible linking sectors, public, private, social, cultural, academic, and networks, which would be strategic to link through projects and agreements with the Openenergy network, in the field of education and open innovation for energy sustainability.

Visibility

To design and implement a plan of communications (visibility) of the network, by means of basic mechanisms defined in a strategic plan to support the dissemination and visibility of the network (corporate image of the network, portal, social media, communities in) repositories, among others.

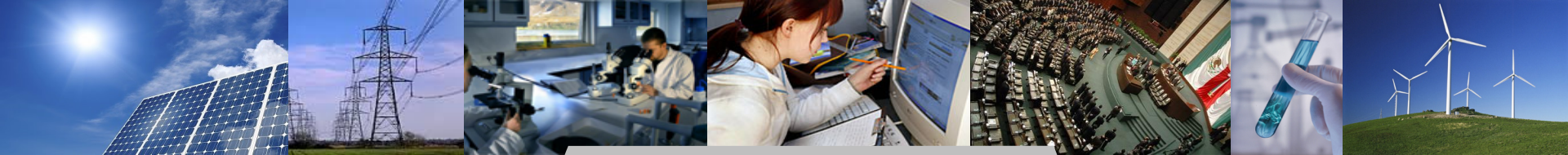


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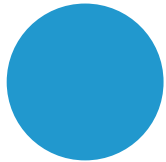


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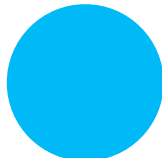


Activities



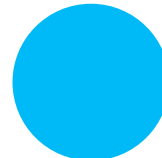
Experimentation

Work from the culture of prototyping, the error, the curiosity, the discovery



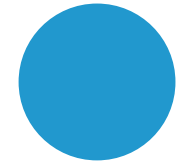
Open

To promote the production of open knowledge and open practices mobilization mechanisms



Collaboration

To promote horizontal processes of co-creation, dialogue and joint construction



Participation

Incorporating the diversity of actors, community and outreach



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Colaboran:



OpenergyLab: laboratory of open educational resources on energy sustainability (sep, 2017)

SEMANA i
OPENERGY LAB Laboratorio de recursos educativos abiertos en sustentabilidad energética

Sustenta TU VIDA, SUSTENTA tu energía, ¡sé verde!

Dirigido a: Alumnos de todas las carreras que cursen entre los semestres 1 y 10, de todos los campus.

Requisitos: Disposición para trabajar en equipos multidisciplinarios, interés en contribuir con recursos creativos para buscar solución de problemas energéticos en México.

Lugar: Campus Monterrey (Tecnológico de Monterrey)

La actividad se desarrollará en colaboración con empresas de energía, productores de medios, expertos en energía, educación e innovación.

Esta es una invitación especial a los alumnos para **participar** en el reto de crear recursos informativos y pedagógicos (REAS) utilizando TICs para contribuir y sensibilizar a la sociedad con información sobre el tema de **sustentabilidad energética**.

Trabajarás en grupo, con **expertos** y visitas a empresas. En este proceso conocido como **laboratorio social**, se generarán los recursos que serán depositados en un repositorio donde toda la comunidad tenga acceso. **¡Anímate, será divertido y harás una contribución para mejorar nuestro mundo!**

Ve el video:
<http://tiny.cc/VideoEnergia>

Tecnológico de Monterrey
Escuela de Humanidades y Educación

energylab.com
Marisol Martínez
marisom@tqm.mx
Campus Monterrey
Edificio S2005 / Oficina S1015
(81) 83581400 ext. 6010
energylab.com

Generado como actividad relacionada con el proyecto "Laboratorio Binacional para la Gestión Inteligente de la Sustentabilidad Energética y la Formación Tecnológica" apoyado por CONACYT-SENER Fondo de energía sustentable (Convênio: 500319-2014-01).
energylab.com

Focus: develop sensitization skills and create proposals for training in energy

Participants: 122 university student participants, 25 mediators and 20 multidisciplinary experts with a social innovation laboratory methodology

Results: 36 open educational resources for energy sustainability by university students



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Colaboran:





2017 Oenergy Network Meeting (dec, 2017)

- **Focus:** generate a work agenda through the development of projects aimed at research, training and linking in educational innovation and energy sustainability
- **Participants:** 42 participants and coordination of expert in strategic planning with Technology Roadmap strategy
- **Results:** 5 project projects that involve a process, product or technological development



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Colaboran:



Online course: Visibility and dissemination of open knowledge (jun 2018)

Focus: Enhance the visibility of the scientific and technological production of innovation of training in visibility and dissemination of open knowledge with the RITEC

Participants: 120 university professors and 85 participants of the UNESCO chair open educational movement for Latin America

Results: 205 certifications on the subject of open access



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Colaboran:



Open visibility project funded by the National Council of Science and Technology Support (jun 2017-jun 2018)

FONDOS CONACYT 2017: Aumento de la visibilidad de RITEC mejorando la experiencia de usuario y su interoperabilidad con el Repositorio Nacional

Focus: the visibility of scientific production, mainly on the subject of energy, in support of Mexico's national open science policy

Participants: multidisciplinary team of 5 areas: Innovation research group in education, Library, Innovation, Legal, Research / Transfer and Information technologies

Results: 3000 open resources in the repository of Tecnológico de Monterrey





UNESCO and ICDE Chairs: Open educational movement for Latin America <http://sitios.itesm.mx/eehcs/unesco/>

International Exchange Program 2015



International Exchange Program 2017



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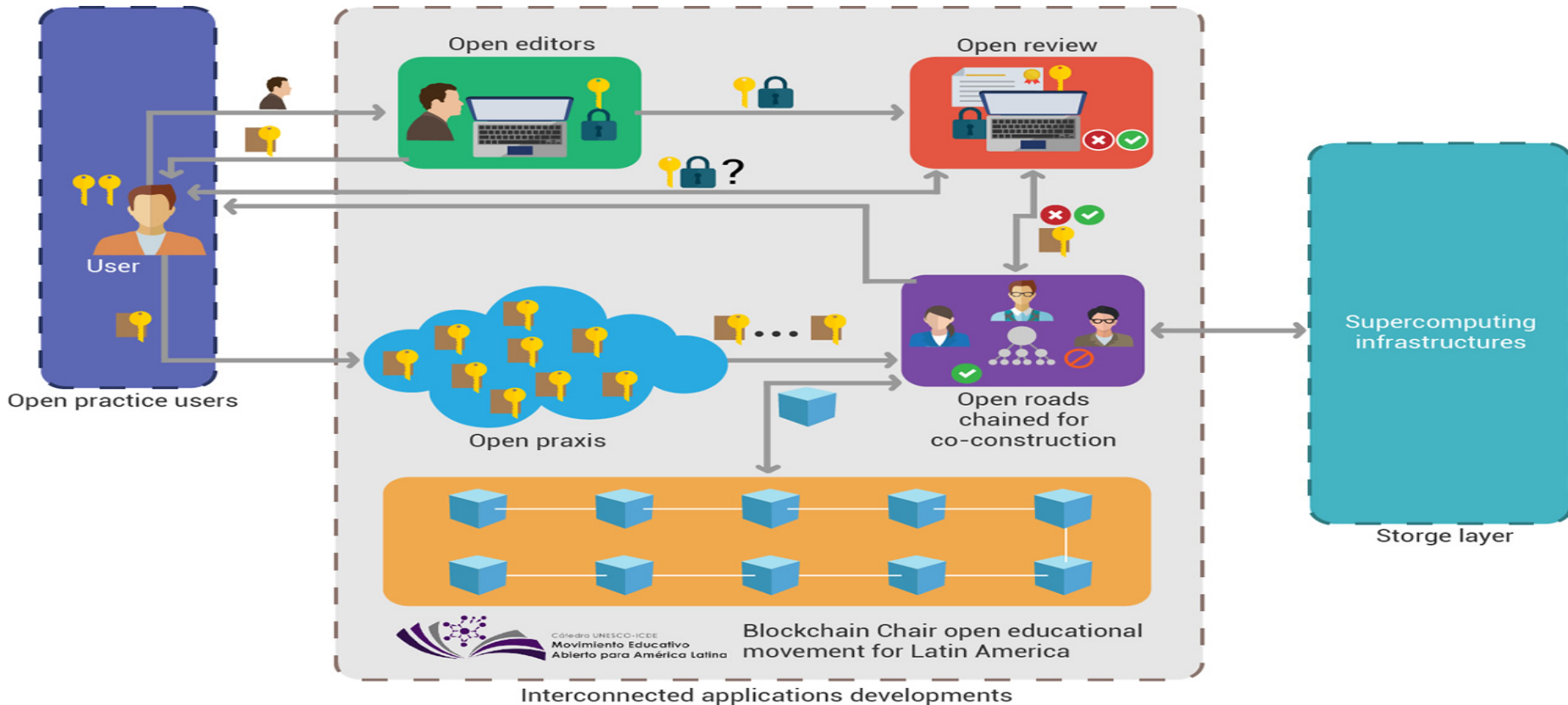
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Openenergy Network & UNESCO and ICDE Chairs: Open educational movement for Latin America and Blockchain



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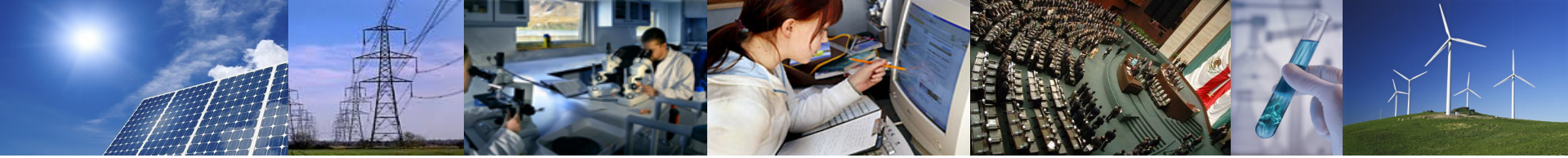


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Next steps

Possibilities

- Improvements in the performance of platforms and tools to promote new open practices
- Infrastructures for academic networks to create their own learning pathways
- Open practices, open content construction, open access
- Participation in collaborative development and open science experiences

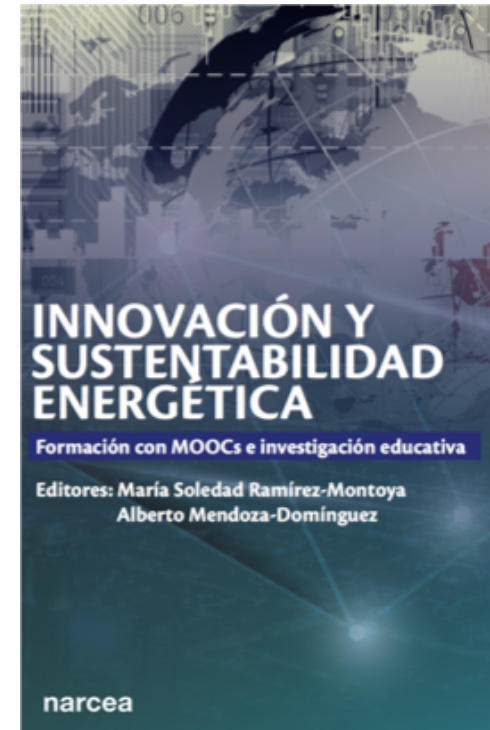
Challenges

- Open chained ways for co-construction
- Knowledge and understanding of blockchain techniques
- Supercomputing infrastructures
- Interconnected application developments



Research

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Colaboran:



¡Thanks!

Marisol Ramírez Montoya
solramirez@tec.mx

Grupo de Investigación e Innovación en Educación
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