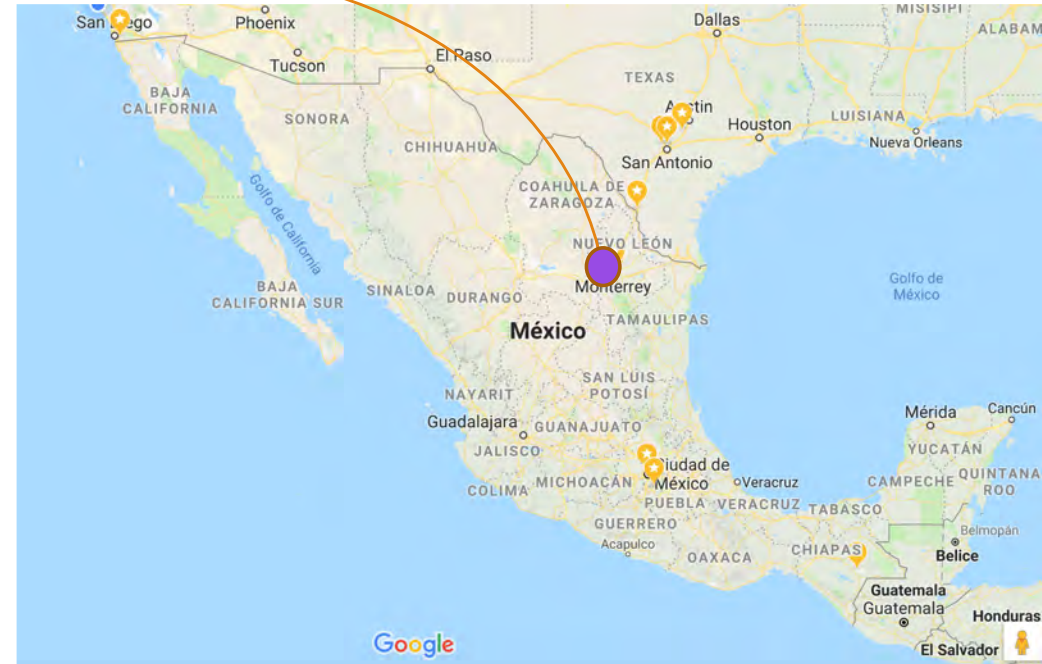


# Understanding the teaching of STEM education through dialogue and transformative learning in Mexico

JUAN MANUEL FERNÁNDEZ-CÁRDENAS  
TECNOLÓGICO DE MONTERREY, MEXICO



# Monterrey, Mexico



# Tecnológico de Monterrey

0 31 Campi

98,935 Students



# Tecnologico de Monterrey

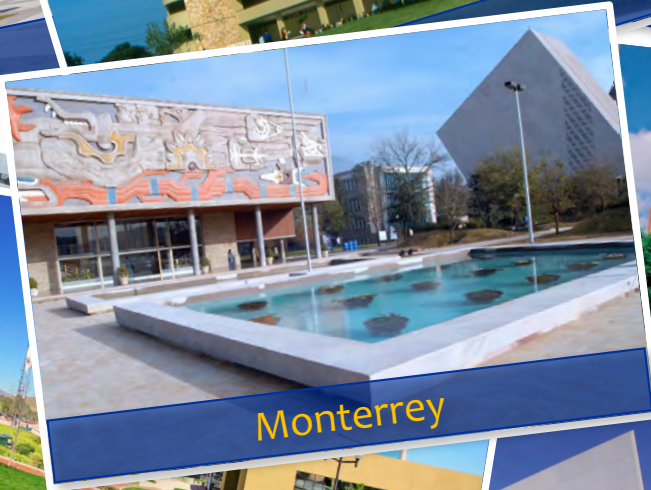
Campi



Querétaro



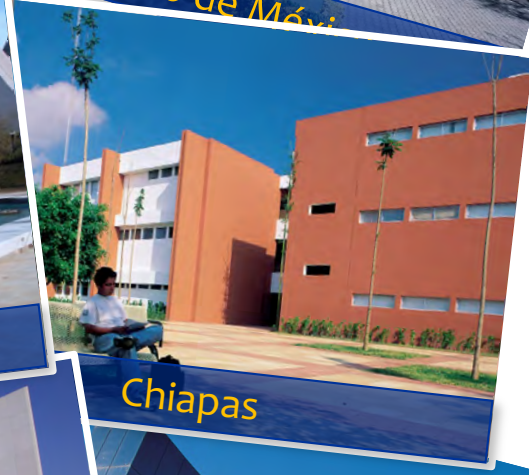
Toluca



Monterrey



San Luis Potosí



Chiapas



Mazatlán



Puebla



Laguna



# STEM Education

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- § Technology-based jobs and careers, and economic growth
- § Reduction of marginalization
- § KIA motors plant in Monterrey, Mexico - 10,000 technology-based jobs

# STEM Education

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- Uneven development and inequalities in the same fashion as the plant has solved social needs
- Automatization of processes - low salaries
- Overcrowded economic housing
- Other urban problems around the factory



# Globalization and STEM education

§ Panacea for  
inequality?

§ STEM education  
can be similarly  
contradictory



# Dialogue and transformative learning

- Education can replicate or restructure the existing social order
- Education should develop a critical consciousness
- Dialogic teaching moves away from the privileging of one voice, towards the development of a dialogic space
- Ethics involved in a space in which two or more voices can express themselves without trying to silence each other



# Vexation



How can we overcome the seemingly contradictory agenda of STEM education in order to simultaneously create economic development and meet the social needs of participants?

# Venture



What sorts of innovations and new approaches are being introduced with regards to the teaching of STEM in Mexico?

# Dialogic participation in the community

The case of Community Centre “Bicentenary of Independence”

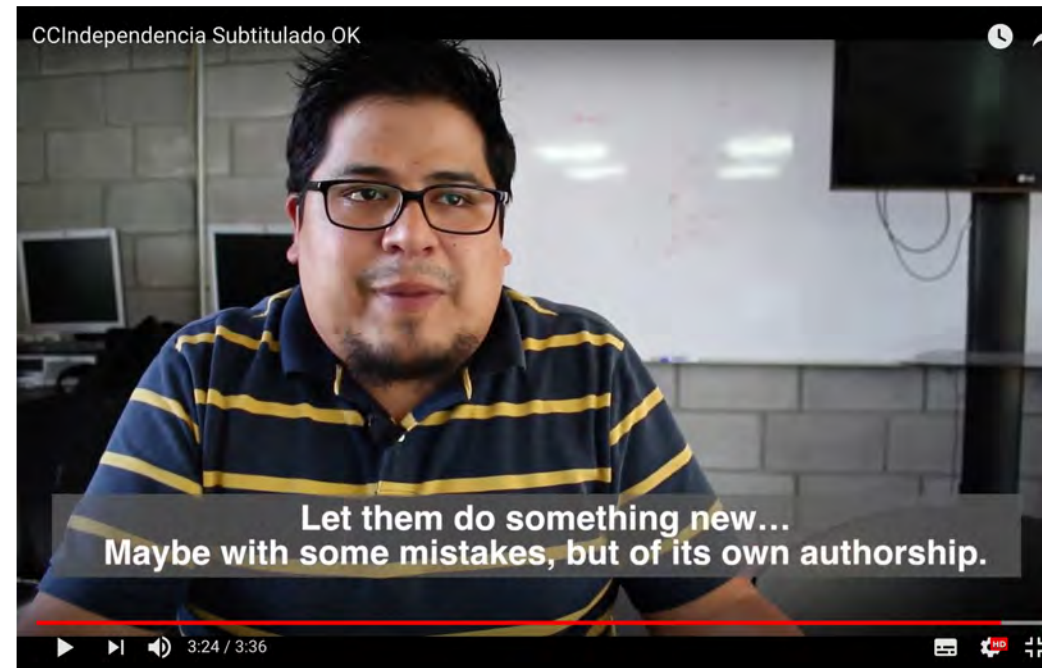
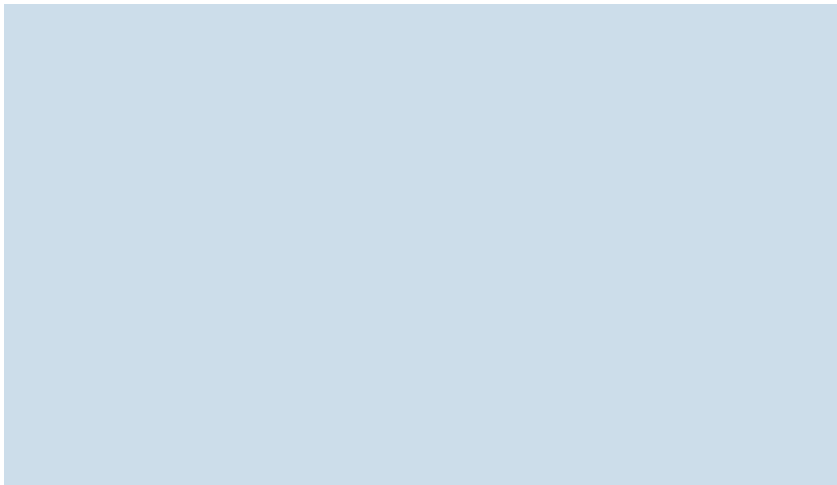
Video available at:

[https://youtu.be/618MCtEj\\_dk](https://youtu.be/618MCtEj_dk)



# participará en Copa Mundial en Alemania

HornoBots, el equipo de robótica del Museo del Acero Horno3, participará en la Copa Mundial de Robótica (RoboCup) en Leipzig, Alemania del 30 de junio al 4 de julio del presente año. El conjunto se prepara para la competencia internacional, tras obtener su pase al ganar el primer lugar del VIII Torneo Mexicano de Robótica, realizado en la Universidad Politécnica de Ciudad Victoria, Tamaulipas.





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Pages 1-19 | Received 03 Feb 2017, Accepted 08 Dec 2017, Published online: 09 Jan 2018

# Higher Education Links – British Council

Reducing marginalization and promoting inclusive education with the mediation of digital technology



Tec21

# Educational model



**1**

**Challenge  
-based  
learning**



**2**

**Flexibility in  
time, space and  
mode**



**3**

**Memorable  
experience**



**4**

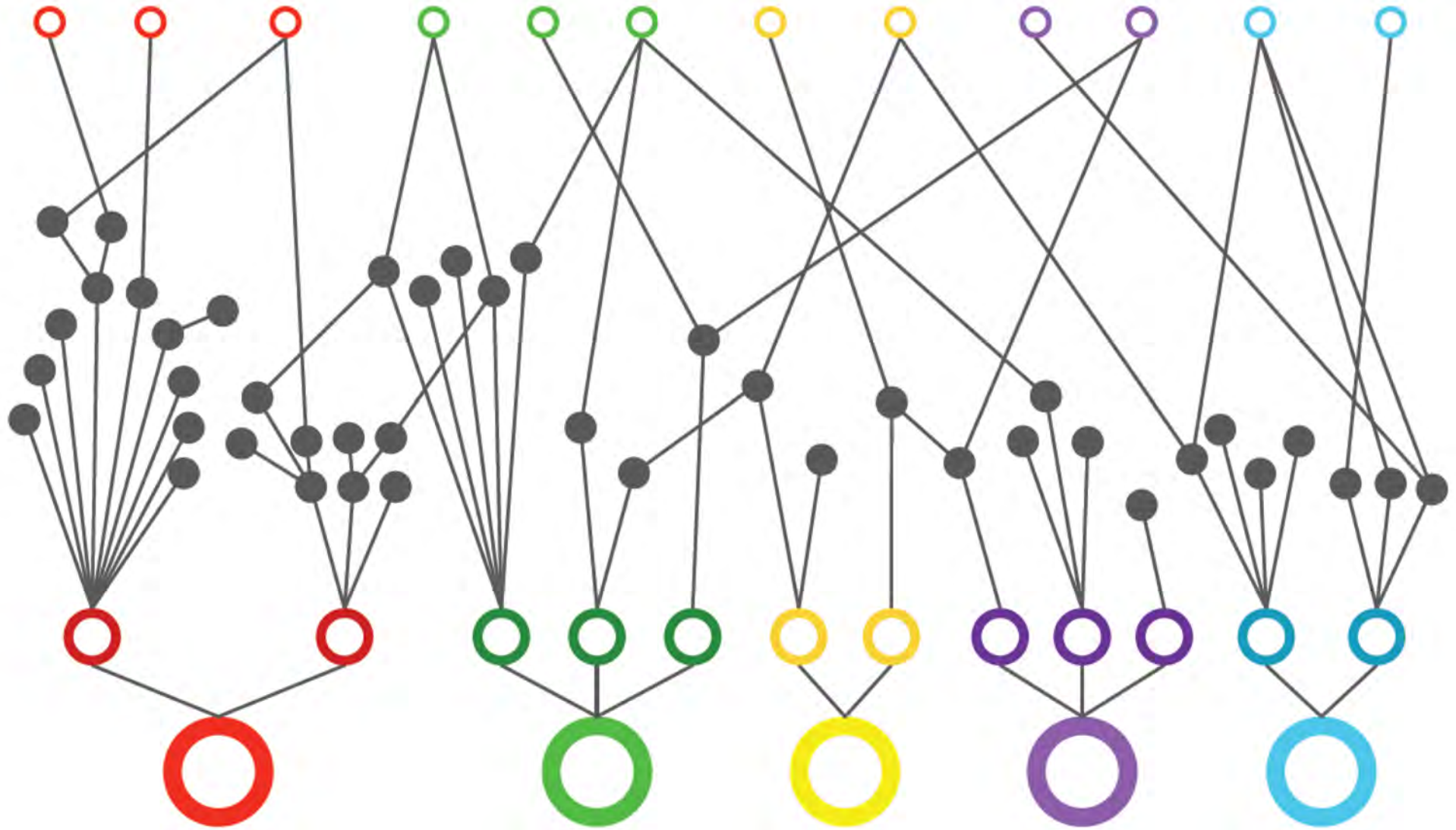
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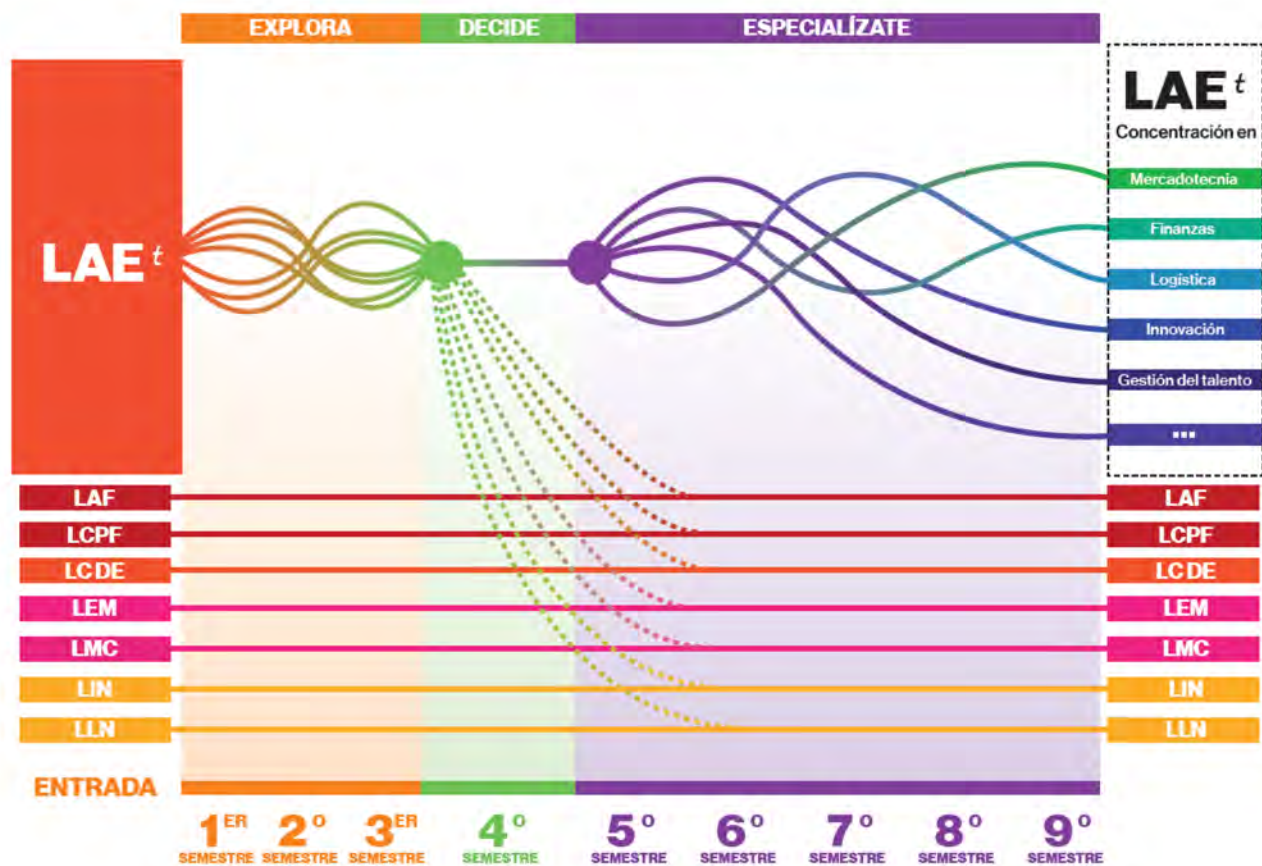
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ÁREA B

ÁREA C







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- LCDE:** Licenciado en Creación y Desarrollo de Empresas
- LEM:** Licenciado en Mercadotecnia
- LMC:** Licenciado en Mercadotecnia y Comunicación
- LIN:** Licenciado en Negocios Internacionales
- LLN:** Licenciado en Logística Internacional

# Conclusion

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STEM education can be a tool for empowering people locally and globally, if the model is part of an agenda privileging social innovation

Marginalized people can engage in the global economy in meaningful ways, if they are afforded access to identities with strong agency

Marginalized people can also benefit from the careful design of educational resources, using UDL

Higher education students can be part of a social transformative agenda through STEM education, if they are allowed to be creative and engage in authentic dialogues with participants in real life situations

Tecnológico de Monterrey has been working in the development of an innovative educational model, with 4 components leading to the construction of flexible academic trajectories, which are also relevant for promoting social and economic change

Contact

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Fernández-Cárdenas**

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