Innovative Teaching Approaches to attract, engage, and maintain women in STEM: W-STEM project

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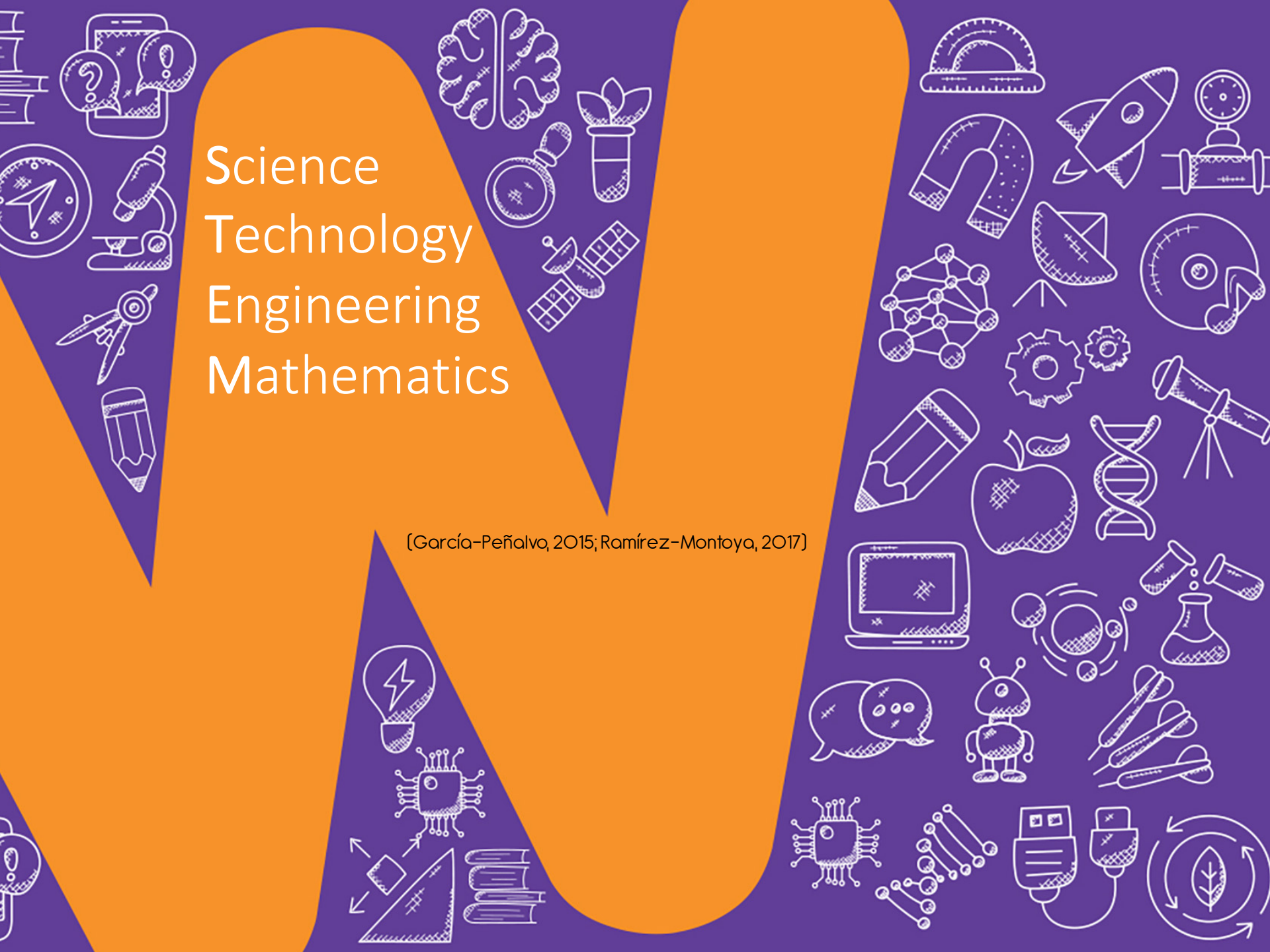
Coimbra Group Seminar

Innovation in Learning and Teaching in Science, Technology, Engineering and Mathematics (STEM) fields

Granada, Spain, 14 November 2019



(García-Peñalvo, 2015; Ramírez-Montoya, 2017)

Outline

- Project information
- Consortium
- Objectives
- Target audience
- Main actions
- Results
- Website and social profiles
- Related projects
- References

1. Project information

Building the future of Latin America: engaging women into STEM

Acronym

W-STEM

Funding body

European Union. ERASMUS + Capacity-building in Higher Educati on Call for proposals EAC/A05/2017

Reference

598923-EPP-1-2018-1-ES-EPPKA2-CBHE-JP

Dates

3 years, 15/01/2019 too 14/01/2022

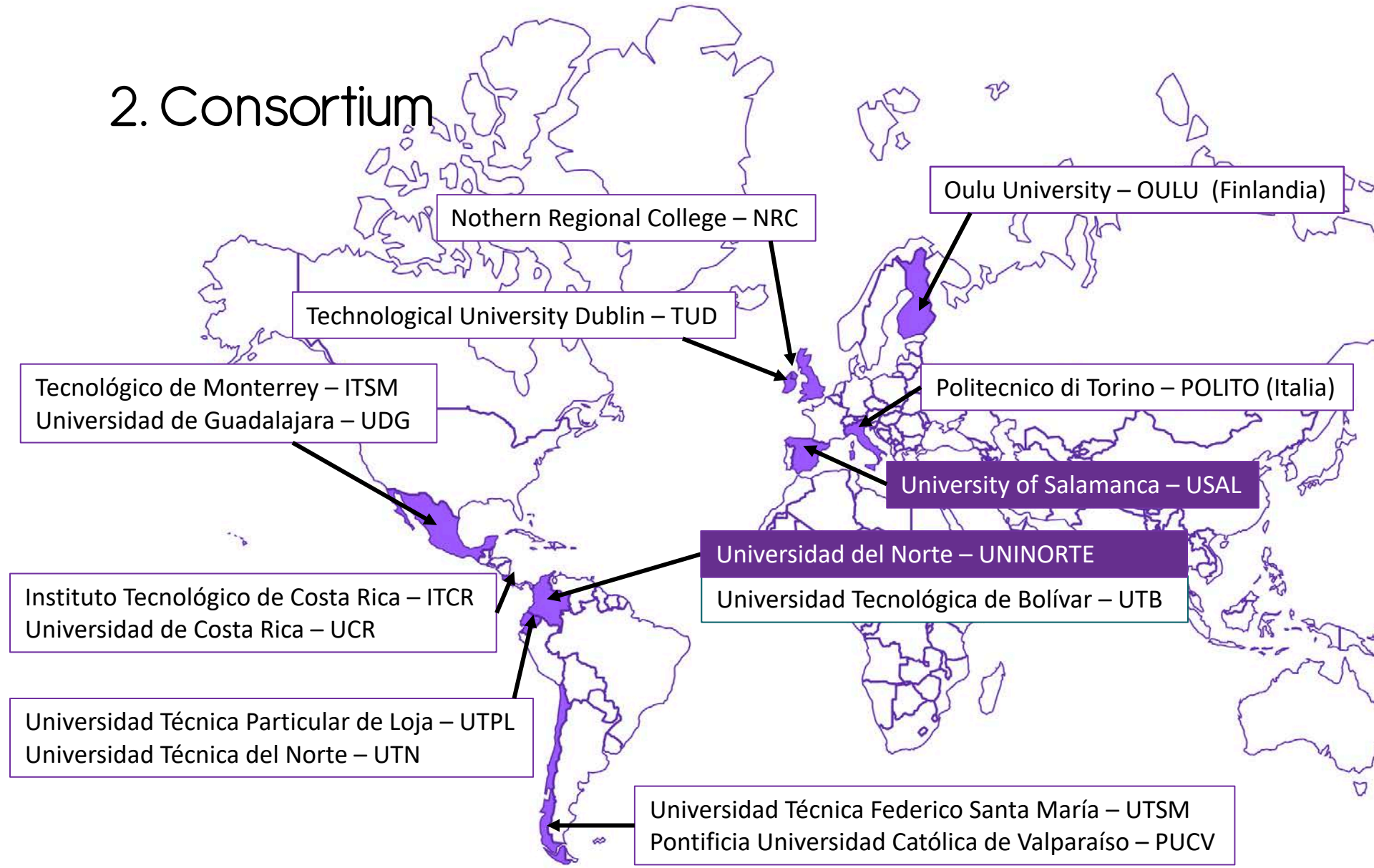
Budget

862.268€

Basic references

(García-Holgado et al., 2019a, 2019b; García-Peñalvo, 2019b, 2019c)

2. Consortium



2. Consortium

Associated Partner

External evaluator

Columbus

3. Objetives

- Improve strategies and mechanisms for attracting, accessing and guiding women in Latin America in STEM higher education programs

- W-STEM aims to guarantee the transformation of the current situation in Higher Education Institutions in Latin America

Photo by Bradley Hook from Pexels
https://goo.gl/VbUxCx

4. Target audience

Higher Education Institutions

STEM programs

Secundary schools

Girls and young women

5. Main actions

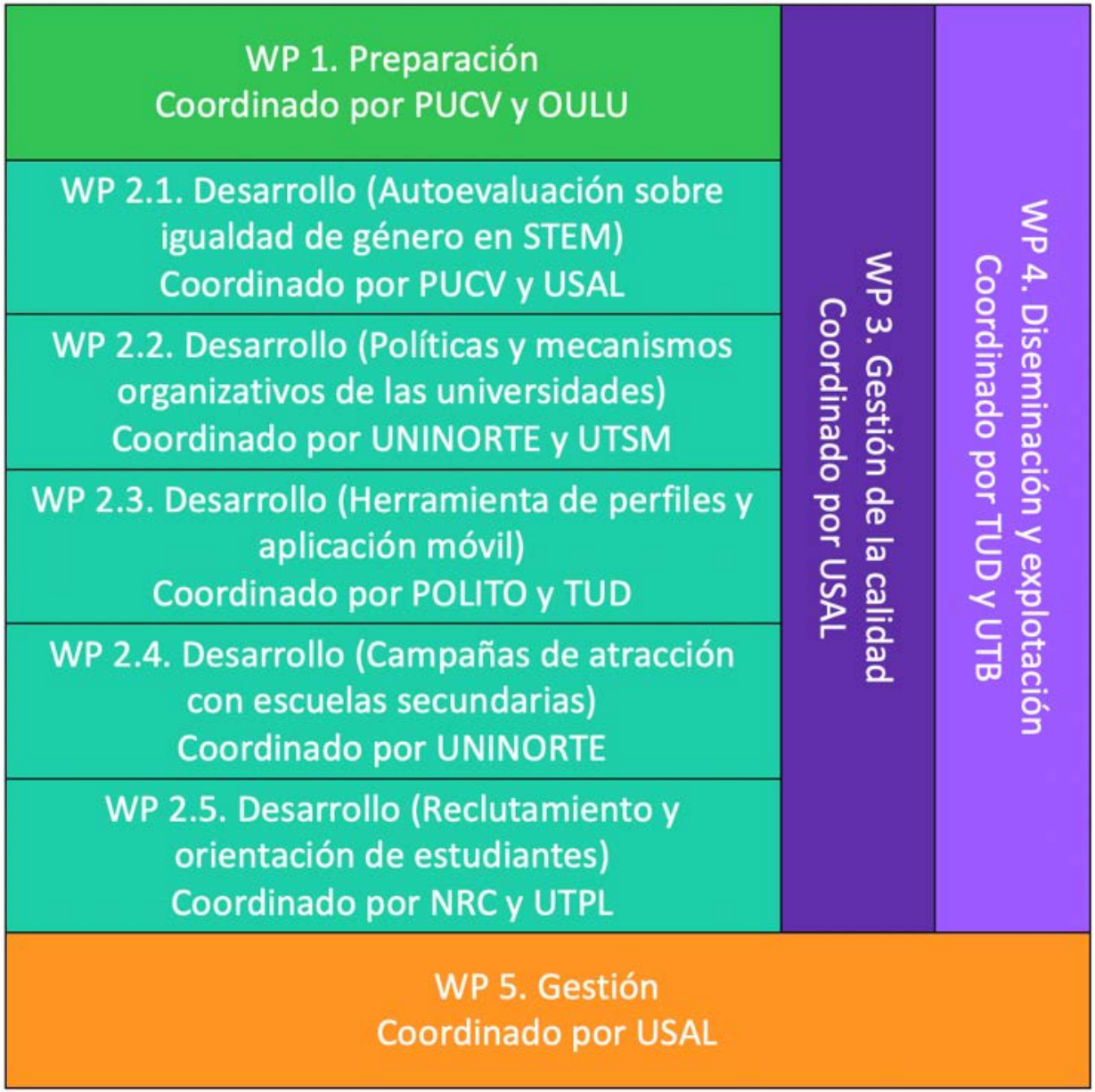
Measure the gender equality in enrolment and retention rates in STEM programs at undergraduate levels

Implement Universities' policies, strategies and organizational mechanisms for improving attraction, access and guidance at undergraduate levels in STEM programs

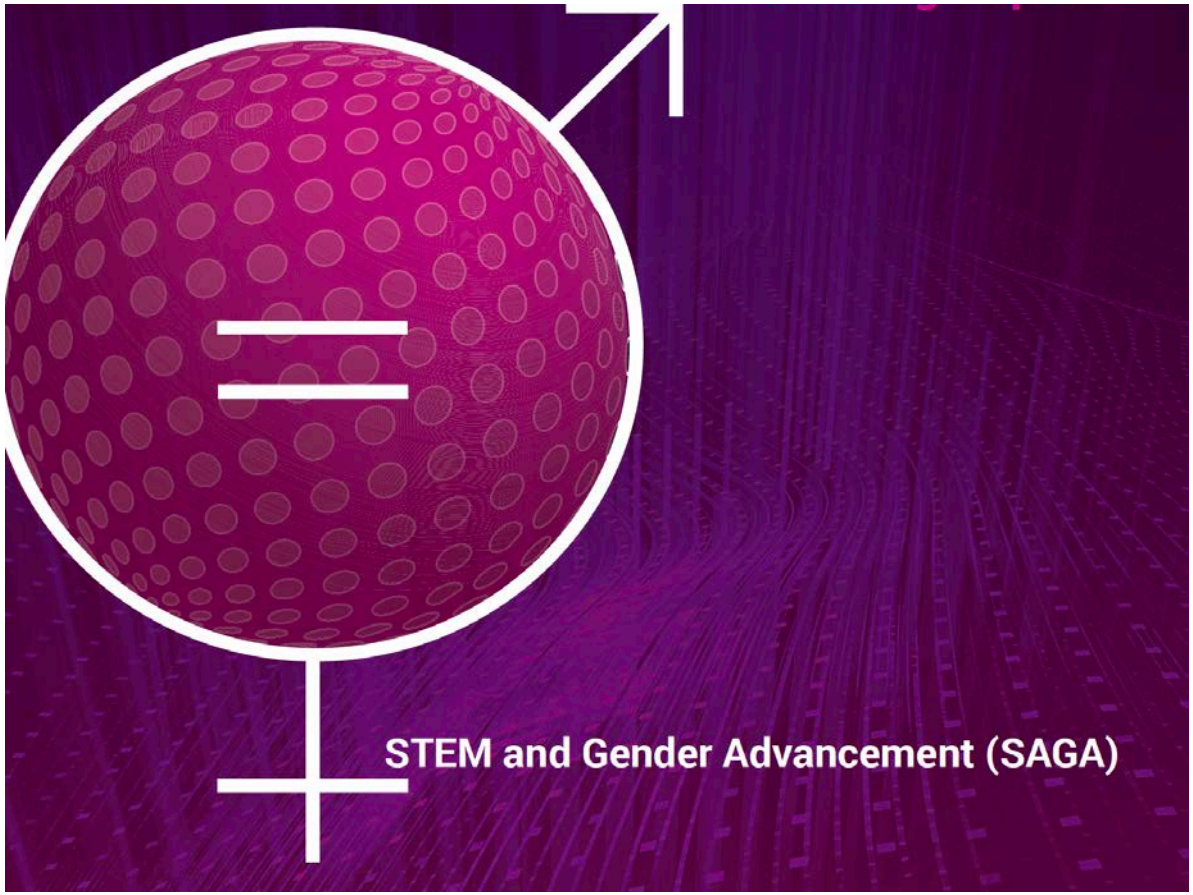
5. Main actions

Promote STEM studies vocation and choice in girls and young women in secondary schools as well as guidance in the first year of the STEM programs.

Develop an online training package for Higher Education Institutions to implement effective strategies to enhance attraction, access and guidance of Women in STEM programs


WP 1. Preparación
Coordinado por PUCV y OULU
WP 2.1. Desarrollo (Autoevaluación sobre igualdad de género en STEM)
Coordinado por PUCV y USAL
WP 2.2. Desarrollo (Políticas y mecanismos organizativos de las universidades)
Coordinado por UNINORTE y UTSM
WP 2.3. Desarrollo (Herramienta de perfiles y aplicación móvil)
Coordinado por POLITO y TUD
WP 2.4. Desarrollo (Campañas de atracción con escuelas secundarias)
Coordinado por UNINORTE
WP 2.5. Desarrollo (Reclutamiento y orientación de estudiantes)
Coordinado por NRC y UTPL
WP 3. Gestión de la calidad
Coordinado por USAL
WP 4. Diseminación y explotación
Coordinado por TUD y UTB
WP 5. Gestión
Coordinado por USAL

6. Results: self-assessment



Self-assessment questionnaire

- The aim is to know the situation of Latin American universities through indicators related to gender equality in STEM programs
- It has been applied in Europe in order to have valuable data to implement possible initiatives beyond the W-STEM project
- The self-assessment survey or matrix is based on the SAGA toolkit (UNESCO, 2017), a set of tools for monitoring and evaluating gender equality and integrating gender aspects into science, technology and innovation policies

Self-assessment questionnaire

- Indicators 4 to 26 have been taken from SAGA toolkit, introducing a small modification in indicator 9 "Total and proportion of women graduates of university programmes by field of study and educational level", leaving only the indicator according to the field of study
- Two indicators have been added
  - Indicator 46 in relation to the orientation of women enrolled and graduating from STEM programmes, based on SAGA indicator 9
  - Indicator 47 to measure female dropout in STEM programmes
- The instrument has been applied after the end of the 2018-2019 academic year in order to be able to work with the 2018 admission data

W-STEM institutional data collection survey

RAPPORTEUR/-a INFO								
Firstname Lastname	**Skype**	**E-mail**	**Mobile**	**Address**	**Zip**	**City**	**Country**	

ISCED-F 2013 variants	BROAD FIELD -->	05 Natural sciences, mathematics and statistics									06 Information and Communication Technologies (ICTs)			07 Engineering, manufacturing and construction												INDUSTRIAL ENGINEERIN	OTHER
ISCED-F 2013 variants	NARROW FIELD -->	051 Biological and related sciences		052 Environment		053 Physical sciences			054 Mathematics and statistics		061 Information and Communication			071 Engineering and engineering trades						072 Manufacturing and processing				073 Architecture and construction			OTHER
ISCED-F 2013 variants	DETAILED FIELD -->	0511 Biology	0512 Biochemistry	0521 Environmental sciences	0522 Natural environments and wildlife	0531 Chemistry	0532 Earth sciences	0533 Physics	0541 Mathematics	0542 Statistics	0611 Computer use	0612 Database and network design and	0613 Software and applications develop	0711 Chemical engineering and processe	0712 Environmental protection technolo	0713 Electricity and energy	0714 Electronics and automation	0715 Mechanics and metal trades	0716 Motor vehicles, ships and aircraft	0721 Food processing	0722 Materials (glass, paper, plastic and	0723 Textiles (clothes, footwear and leather)	0724 Mining and extraction	0731 Architecture and town planning	0732 Building and civil engineering		Please specify
INSTITUTIONAL BACKGROUND INFO	**COLUMN FOR TEXTUAL COMMENTS**																										
INSTRUCTION: Please provide information on formal structures that could provide some insight on institutional purpose i.e. special activities and policies. These questions on programmes, staff and students will help us to understand the	WRITE YOUR ANSWER HERE																										
PROGRAMMES																											
INSTRUCTION: Mark all ISCED-F 2013 variants that you offer programmes	*INSTRUCTION: If you do not have ISCED-F 2013 disaggregated data you may fill information to this column.*																										
P.1. Which programmes / courses are you using for data collection, by field of study?																											
P.2. Do you have unique multidiciplinary STEM programmes that intend to attract especially female students?	WRITE YOUR ANSWER HERE																										
P.3. Lenght of programmes (years / months)	WRITE YOUR ANSWER HERE																										
4. STAFF	Teacher play an important role as models for students at all levels of education.																										
INSTRUCTION: Fill in the total and share of female staff by field of study (STEM-variant of ISCED-F 2013):	*INSTRUCTION: If you do not have ISCED-F 2013 disaggregated data you may fill information to this column.*																										
4.1. Provide the total number of teaching staff members for first year of programmes in your university by field of study in 2018.																											
4.2. Provide the total number of female teaching staff members for first year of programmes in your university by field of study																											
4.3. Provide the total number of staff trained on gender issues in education.																											
4.4. Provide the total number of female staff trained on gender equality issues in education.																											
Related policies:																											
4.5. What, if any, training on gender issues education does your university provide for its staff in STEM programmes?	WRITE YOUR ANSWER HERE																										
4.6. What, if any, benefits does your university provide for its staff advancing their gender competence?	WRITE YOUR ANSWER HERE																										
5. STUDENTS																											
INSTRUCTION: Fill in the total and share of female stUDENTS by field of study (STEM-variant of ISCED-F 2013)	*INSTRUCTION: If you do not have ISCED-F 2013 disaggregated data you may fill information to this column.*																										
5.1. Provide the total number students by field of study in 2018 in your institution.																											
5.2. Provide the total number of female students by field of study in 2018.																											
6. ATTRACTION	How interested women are to apply to study in STEM programs?																										
INSTRUCTION: Fill in total and share of female applicants to university by field of study (STEM-variant of ISCED-F 2013)	*INSTRUCTION: If you do not have ISCED-F 2013 disaggregated data you may fill information to this column.*																										
6.1. Provide the total number of applicants for first year of programmes in your university by field of study in 2018.																											
6.2. Provide the total number of female applicants for first year of programmes in your university by field of study in 2018.																											
Related policies:																											
6.3. What, if any, policies, processes and activities does your university implement as part of its attraction campaigns for	WRITE YOUR ANSWER HERE																										
6.4. What, if any, policies, processes and activities does your university implement as part of its attraction campaigns specifically for female applicants for STEM programmes?	WRITE YOUR ANSWER HERE																										

6. Results: mobile app

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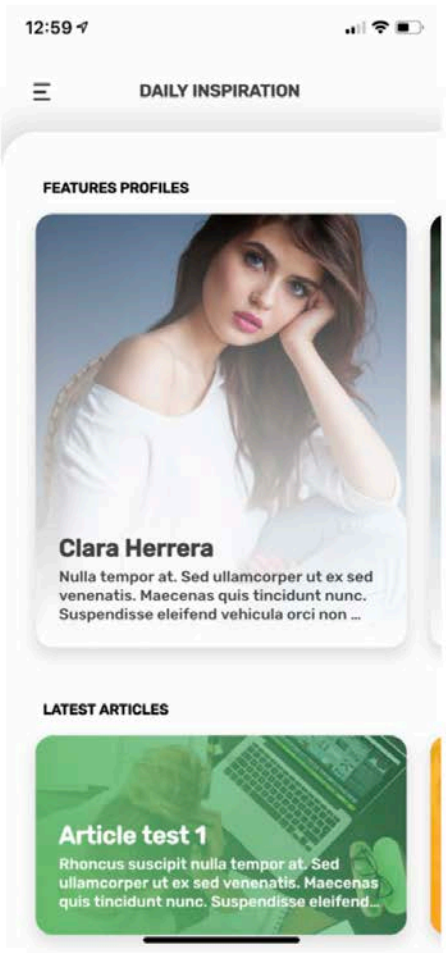
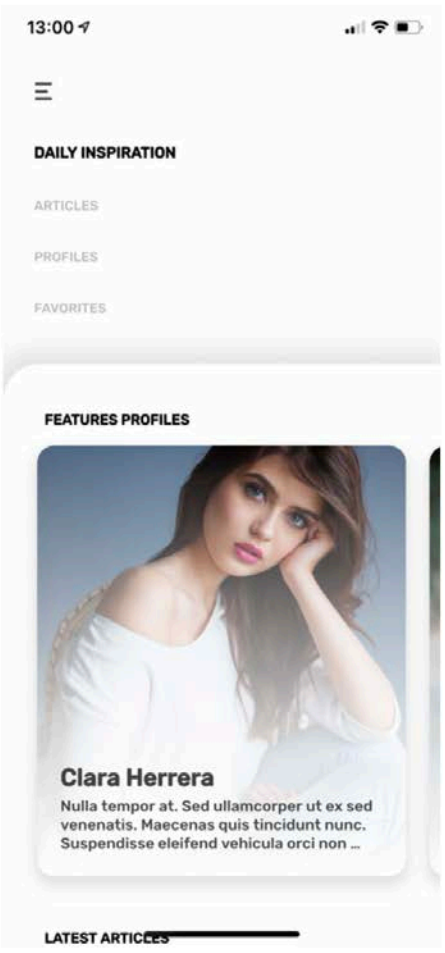
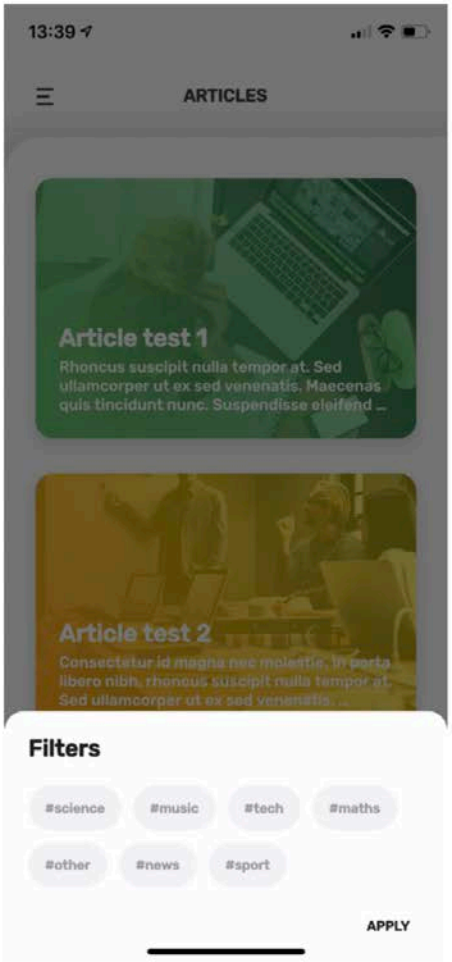






Iñaki Tajes

Dr. Maria Biola Javierre Martínez, 2019 International Rising Talent (España). Biological Sciences, Molecular Biology, Genomics

Prof. Karen Hallberg, 2019 Laureate for Latin America (Argentina). Bariloche Atomic Center, CNEA/CONICET

Dr. María Molina, 2019 International Rising Talent (Argentina). Chemistry, Physical chemistry, Molecular biology

Dr. Ana Sofia Varela Gasque, 2019 International Rising Talent (México). Chemistry, Electrochemistry, Catalysis

6. Results: role models interviews

7. Website and social profiles

https://wstemproject.eu

wstemproject@gmail.com

Twitter

@WSTEMProject

Official hashtag

#WSTEMproject

Instagram

@wstemproject

Facebook

https://www.facebook.com/wstemproject

YouTube

https://www.youtube.com/channel/UCS1EzRQqziO3AEYWSFMER_Q

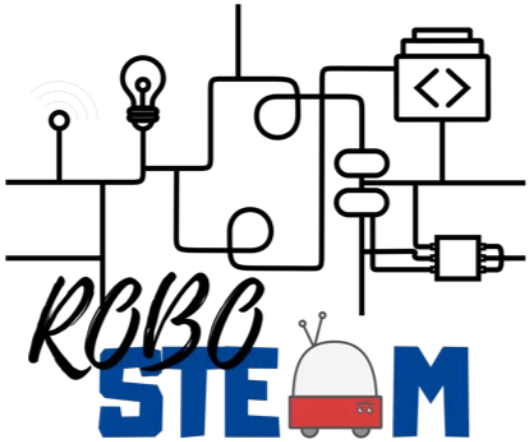
8. Related projects

http://www.taccle3.eu/

(García-Peñalvo, 2016a, 2016b, 2017; García-Peñalvo et al., 2016c, 2016d, 2018; García-Peñalvo & Mendes, 2018)

Virtual Alliances for Learning Society
http://virtualalliances.eu/

(García-Peñalvo et al., 2014a, 2014b, 2015a, 2015b, 2016a, 2016b)



ROBOSTEAM - Integrating steam and computational thinking development by using robotics and physical devices

http://robosteamproject.eu/

(Conde-González et al., 2019; Fernández-Llamas & Conde-González, 2019; García-Peñalvo, 2019c; Gonçalves et al., 2019)

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Wstem

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Politecnico di Torino

Universidad de Costa Rica

UTN Universidad Técnica del Norte

UTPL Universidad Técnica Particular de Loja

Universidad Tecnológica de Bolívar

Universidad del Norte

Universidad de Salamanca

Dublin Technological University

Northern Regional College

Tecnológico de Monterrey

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