

# Technical Training as a Way to Promote Water Technology in Brazil

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# Early 40's

- **SENAI – National Service for Industrial Apprenticeship**
- **100% Private institution, non-profit, maintained by Brazilian industries**

## **Created to:**

- **Promote the development of the national industry**
- **Increase technical knowledge of human resources**
- **Increase industries technological know-how**

# The 80's and 90's

- In Curitiba: Technical School of Sanitation (SENAI CIC)
- We graduate several technicians for the main Brazilian sanitation companies and industries



In this site it's going to be built the Technical School of Sanitation, a SENAI-SANEPAR enterprise aiming to graduate workers for the entire country.

# Nowadays

- Industrial Apprenticeship
- Professional Initiation
- Professional Qualification
- Technical Courses
- Technological Graduation (College)
- Post-graduation (Specialization and M.Sc.)
- In-company Training

VET – Vocational  
education and  
Training in the  
environmental  
and sanitation  
sector

Professional education

Technology development

- 
- Laboratory Tests
  - Applied Research and Innovation
  - Consultancy Services



# Water sector in Brazil

- Brazil is a country of extreme situations
- In Curitiba (southern Brazil): 99,9% of wastewater is collected and treated



- In some cities at the northeast: lower than 25%...



# What we want to achieve...

- **In spite of opposite scenarios:**
- **There's a great potential to be developed...**
- **There's a lot of workers to be instructed...**
- **In both scenarios...**

# VET impact

- Allow the proper functioning of the treatment steps
- Optimize the treatment efficiency
- Avoid unnecessary costs
- Meet law and regulatory parameters
- Highlight energy efficiency





# Just some samples of our latest results...

- Water Technology training to SANEPAR workers (188 h):



**Outcomes:**

- Implementation of new standard routines in WWTP daily operation
- Creation of a database for suspended and/or total solids measurements
- Enhanced procedures to discharge sludge in UASB reactors



# Just some samples of our latest results...

- In company training: Suspended solids control and sludge microscopy procedures in WWTPs (24 h)
- Activated sludge by oxidation ditches ( $Q_{\text{average}} = 1.2 \text{ m}^3/\text{s}$ ):



## Outcomes:

- Implementation of VSS, FSS, SVI and sludge microscopy measurements in WWTP daily routines
- Over US\$ 100,000.00 / year economy in chlorine consumption for filamentous bulking control

# Just some samples of our latest results...



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# REVISTA AIDIS

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**NOVAS ROTINAS OPERACIONAIS COMO  
FORMA DE MELHORIA DE PROCESSO E  
REDUÇÃO DE CUSTOS EM UM SISTEMA DE  
LODOS ATIVADOS: ESTUDO DE CASO**

*NEW OPERATIONAL ROUTINES AS PROCESS UPGRADE  
AND TO DECREASE COSTS IN AN ACTIVATED SLUDGE  
SYSTEM: A CASE STUDY*

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Wellington Ignácio Jaworski<sup>2</sup>  
Juliene Paiva Flores<sup>1</sup>



# WorldSkills Water Technology

- Promotes the collaboration among the countries:
- In 2017, in Abu Dhabi, 6 countries get together to compete in Water Technology;
- In 2019, in Kazan, 13 countries already sign up for the competition;



This is a kind of education standards for the water sector worldwide



When so much countries agree on certain task

That will have an impact in the world of water professionals and educators

# WorldSkills Water Technology

- Due to its know how in sanitation and environmental education...

WS São Paulo 2015

WS Abu Dhabi 2017

2018

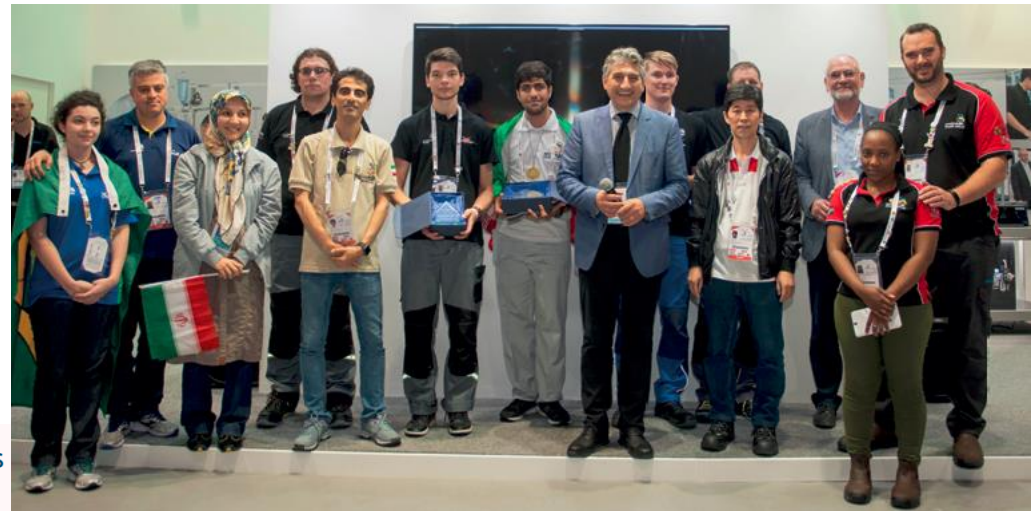
SENAI represent Brazil in the first competition that preceded Water Technology;

SENAI represent us again in Water Technology;

Professor Rodrigo Zawadzki from SENAI is elected as the Skill Competition Manager.



WS São Paulo 2015

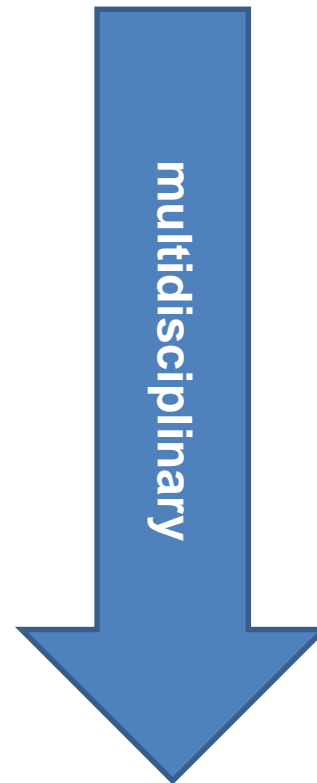


WS Abu Dhabi 2017



# Water Technology – new skill

- Recreate the day to day routine in a Water or Wastewater facility



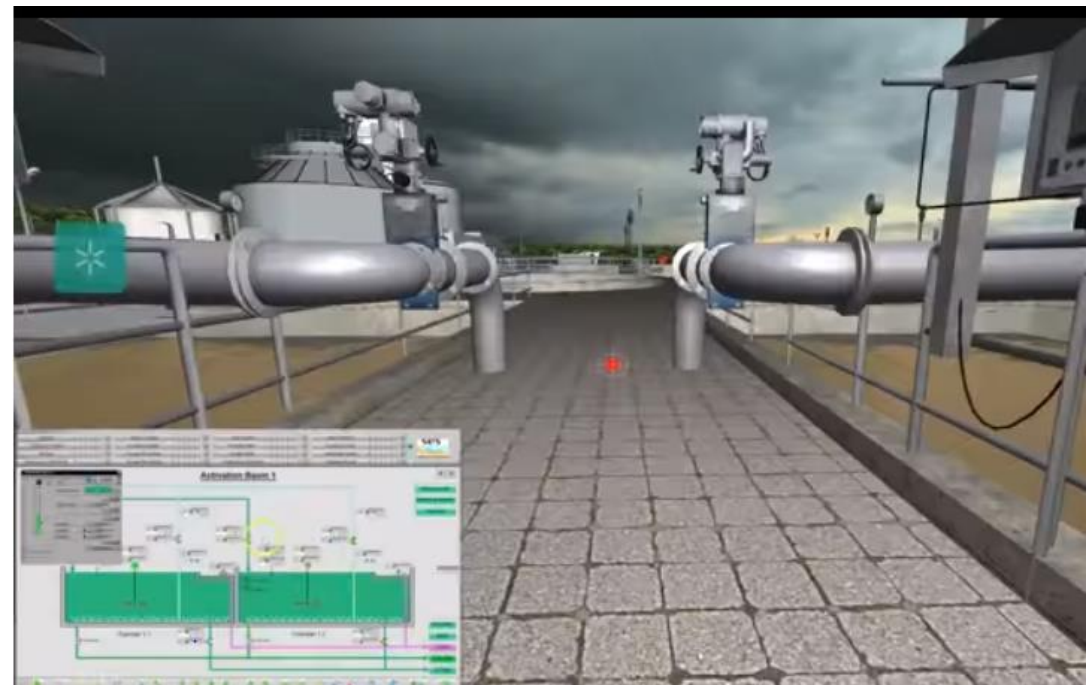
- Chemistry/Biology;
- Environmental protection;
- Electronics/Automation;
- Mechanical maintenance;

# Water Technology

- Virtual reality – where we simulate the “everyday inspection” in treatment plants



Users view: Pump repair task



Users view: Fault finding in a water treatment step



# Water Technology

- Competitor might find a faulty equipment in the “VR walkthrough”
- Then, he/she will have to fix the problem in a real equipment



Pump repair



Slide valve repair

# Water Technology

- Competitor might find a operational problem, such as chemical or biological instability in the “VR walkthrough”
- Then, he/she will have to analyze and propose the proper adjust to fix the problem in a real lab



Lab task



Jar test protocol



# Water Technology

- A sound alarm will go off in the VR comand room...
- Then, he/she will have to troubleshooting the proper automation solution in a real equipment



Filling level sensors calibration



Sandfilter backwash troubleshooting

# Conclusion

- Worldwide: Brazil and Germany are taking the leadership in developing the Water Technology professional formation standards
- Brazil's scenario: SENAI's roll in promoting the technology and industry development through education





**Thank you for your time!!!**

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