



# University teaching qualification (UTQ) experiences from the Netherlands: Mandatory requirements and teaching tasks

Eldon R. Rene and M. Estefanía López

Email: [e.raj@un-ihe.org](mailto:e.raj@un-ihe.org)



# IHE Delft and the UN

IHE Delft is a member of both the UN Water and the UNESCO Water family. IHE Delft is the only education institute within UNESCO focused on water.

The Institute works closely with other UNESCO water related organizations, particularly International Hydrological Programme (IHP) and the World Water Assessment Programme (WWAP). We also work with the World Meteorological Organization (WMO), the Food and Agriculture Organization (FAO) and several other UN organizations.

IHE Delft is leading an initiative with UNESCO IHP to establish an education indicator for SDG6.



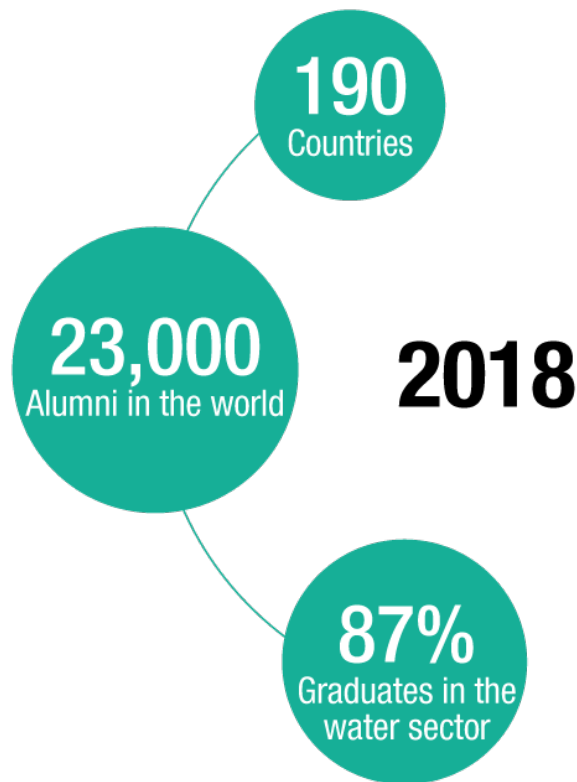
# Why there is a need for water professionals

The population currently affected by land degradation/desertification and drought is estimated at 1.8 billion people, making this the most significant category of 'natural disaster'.<sup>1</sup>

Sustainable Development Goals place great emphasis on protection and maintenance of sustainable water use, reduction of pollution and ecosystem services.<sup>2</sup>

Environmental risks continue to dominate the results of our annual Global Risks Perception Survey (GRPS). This year, they accounted for three of the top five risks by likelihood and four by impact.<sup>3</sup>





IHE Delft Institute for Water Education is the largest international graduate education institute in the field of water. The institute confers fully accredited MSc degrees and PhDs.

Since 1957 the Institute has provided education to more than 23,000 water professionals from over 190 countries, the vast majority from the developing world.

124 PhD fellows\* are currently enrolled in water-related research. The Institute carries out numerous research and capacity development projects throughout the world.

# Education & Training

IHE Delft offers a wide range of flexible, high quality, specialized educational programmes to respond to the needs of diverse clients from the water sector.

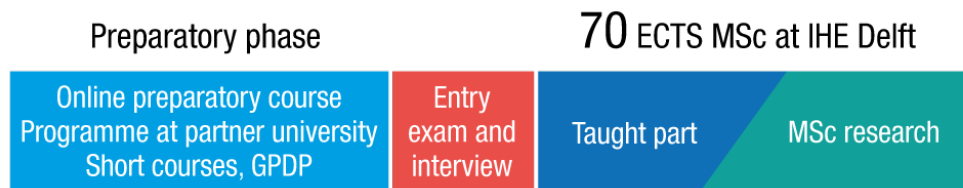
- MSc programmes
- Short courses
- Online courses
- Tailor-made training



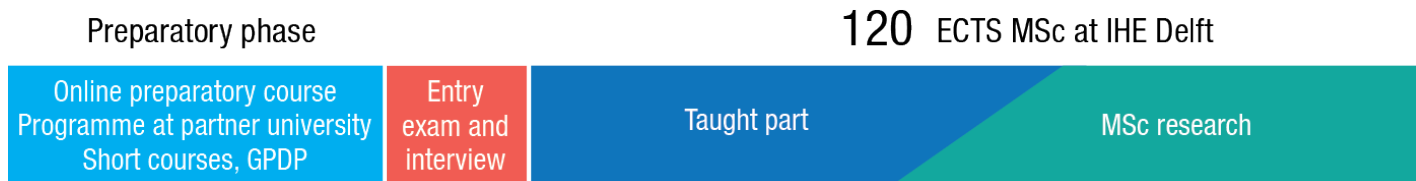
# MSc programmes & specializations

- IHE Delft offers 5 accredited international Master of Science programmes, with a total of 17 specializations.
- The programmes are designed for professionals who want to deepen their expertise, and wish to gain substantial insight into the global water agenda.
- Future direction: 70 ECTS MSc for those requiring academic training as a water professional and 120 ECTS MSc for those aspiring an academic career.

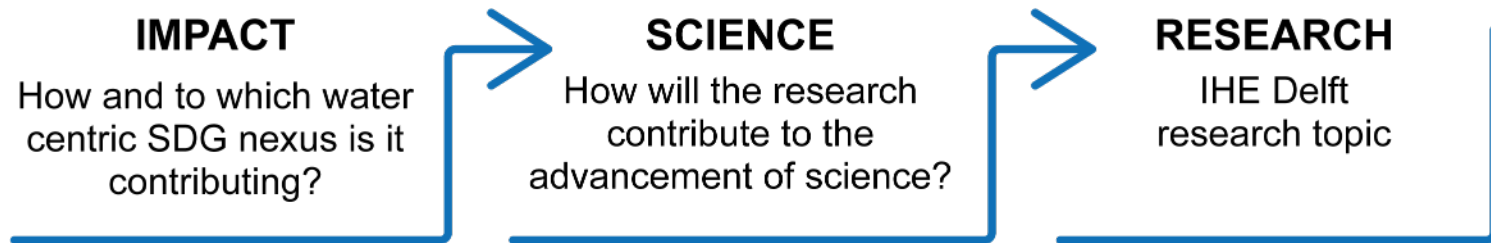
## MSc for water professionals



## Research MSc



## Research from SDGs to applied research



Relates to **all Sustainable Development Goals in which water is key**  
**Contributes to the knowledge base concerning capacity development in the water sector with a special focus on the Global South**

- problem-focused
- solution oriented
- demand-driven



# What is an University Teaching Qualification (UTQ)?

- The University Teaching Qualification, UTQ certification, has been made compulsory for all lecturers, university lecturers, senior university lecturers and professors working at Dutch universities.
- It functions as a reliable frame of reference with respect to the staff members didactic skills.

# The process of getting an UTQ !

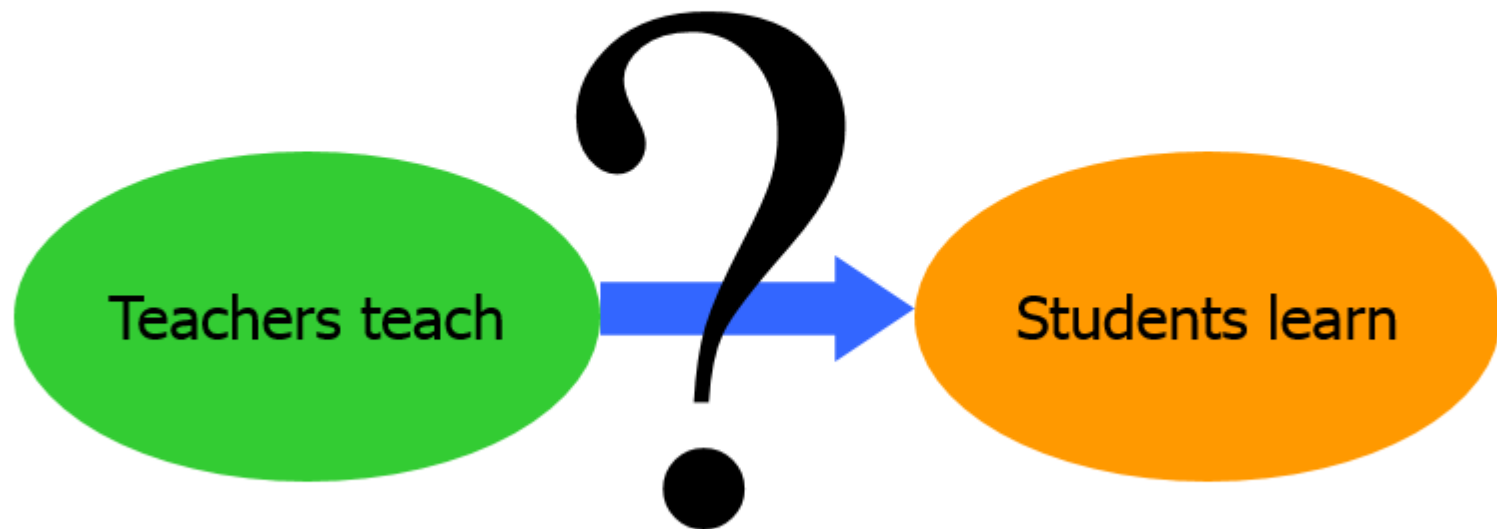
- During the UTQ classroom/contact sessions, the staff members have access to a series of ongoing courses, allowing lecturers to develop all facets (creativity) of teaching.
- Creating a **portfolio** as a teacher, which is then evaluated by an external committee.

# Composing a (digital) teaching portfolio that demonstrates your didactic competencies

## **Competence areas:**

- Performing at a level appropriate for an academic educational environment
- Making and delivering a lecture plan
- Preparing and giving lectures
- Supervising students
- Professionalization

# Teaching and learning



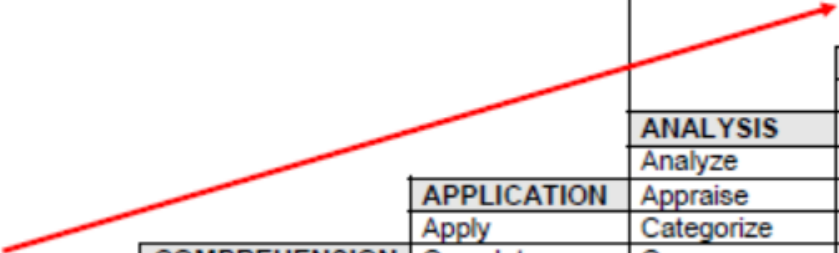


# Defining the learning objectives of the course

## Bloom's Taxonomy of Measurable Verbs

Benjamin Bloom created a taxonomy of measurable verbs to help us describe and classify observable knowledge, skills, attitudes, behaviors and abilities. The theory is based upon the idea that there are levels of observable actions that indicate something is happening in the brain (cognitive activity.) By creating learning objectives using measurable verbs, you indicate explicitly what the student must do in order to demonstrate learning.

Verbs that demonstrate **Critical Thinking**



				EVALUATION	
				Appraise	
		SYNTHESIS		Argue	
		Arrange		Assess	
		ANALYSIS		Choose	
		Analyze		Compare	
		APPLICATION		Conclude	
		Appraise		Estimate	
		Apply		Evaluate	
		COMPREHENSION		Interpret	
		Complete		Judge	
		Compare		Justify	
KNOWLEDGE		Construct		Measure	
List	Describe	Demonstrate		Rate	
Name	Discuss	Dramatize		Revise	
Recall	Explain	Employ		Score	
Record	Express	Illustrate		Select	
Relate	Identify	Interpret		Support	
Repeat	Recognize	Operate		Value	
State	Restate	Practice			
Tell	Tell	Schedule			
Underline	Translate	Sketch			
		Use			
		Test			
		Setup			

# Example of learning objectives

## Learning Objectives

- 1 Suggest options for preventing pollution within urban and industrial water management settings
- 2 Describe the responsibilities of companies for their impact on environmental resources and assess the environmental impact of products and processes
- 3 Compare different methods for industrial wastewater treatment and resource recovery
- 4 Give examples for the applications of environmental management systems in the industrial context
- 5 Differentiate between the sustainable use of various resources and its benefits for reducing environmental burden(s)
- 6 Analyze the different system tools that support industrial ecology and make basic calculations related to life cycle analysis
- 7 Categorize products designed for sustainability based on their contribution towards the circular economy of a country

## Assessments

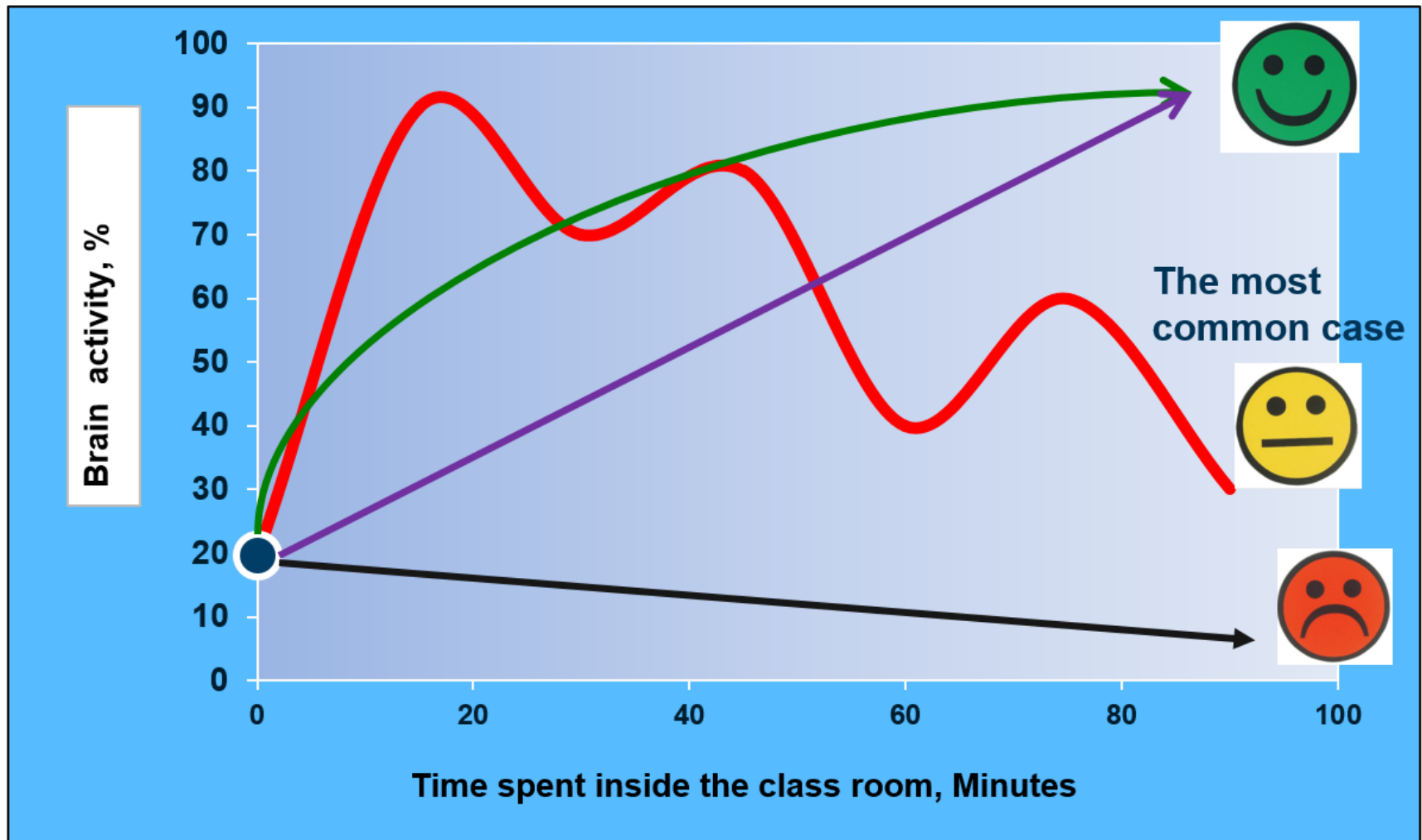
%	Type	Name
60	Written examination (open book)	Examination is on-line using Ecampus
40	Assignment	Group marks for the group work (a case-study), final presentation and final report submission

# Example of topic description and study hours

Topics table

Nr	Topic	Lecture	Assignment	Exercise	Lab session and report	Fieldtrip	Design Exercise	SUM: contact hours	SUM: workload hours	Lecturers 0
1	Introduction to the field of Cleaner Production (CP)	6	0	1	0	0	0	7	19	E.R. Raj
2	Life Cycle Analysis (LCA), Eco-design	4	0	0	0	0	0	4	12	L.F. Dijk
3	Environmental Management Systems	4	0	0	0	0	0	4	12	M. Grashof
4	Corporate social responsibility (CSR)	4	0	0	0	0	0	4	12	E. van Galen
5	Material Flow Analysis (MFA)	5	0	7	0	0	0	12	22	V.S. Rotter
6	Eco-industrial parks and Industrial ecology (EIP and IE)	4	0	0	0	0	0	4	12	E.R. Raj
7	Industrial Water Management - Processes and case studies	2	0	0	0	0	0	2	6	H.A. Garcia Hernandez
8	Simulation game - fun factory	0	0	4	0	0	0	4	4	E.R. Raj
9	Technologies for the recovery of metals from e-waste	2	0	0	0	0	0	2	6	E.R. Raj
10	Group work	3	6	12	0	0	0	15	27	E.R. Raj
11	Field trip	0	0	0	0	8	0	8	8	E.R. Raj
Total		34	6	24	0	8	0	66	140	

# Typical classroom climate chart



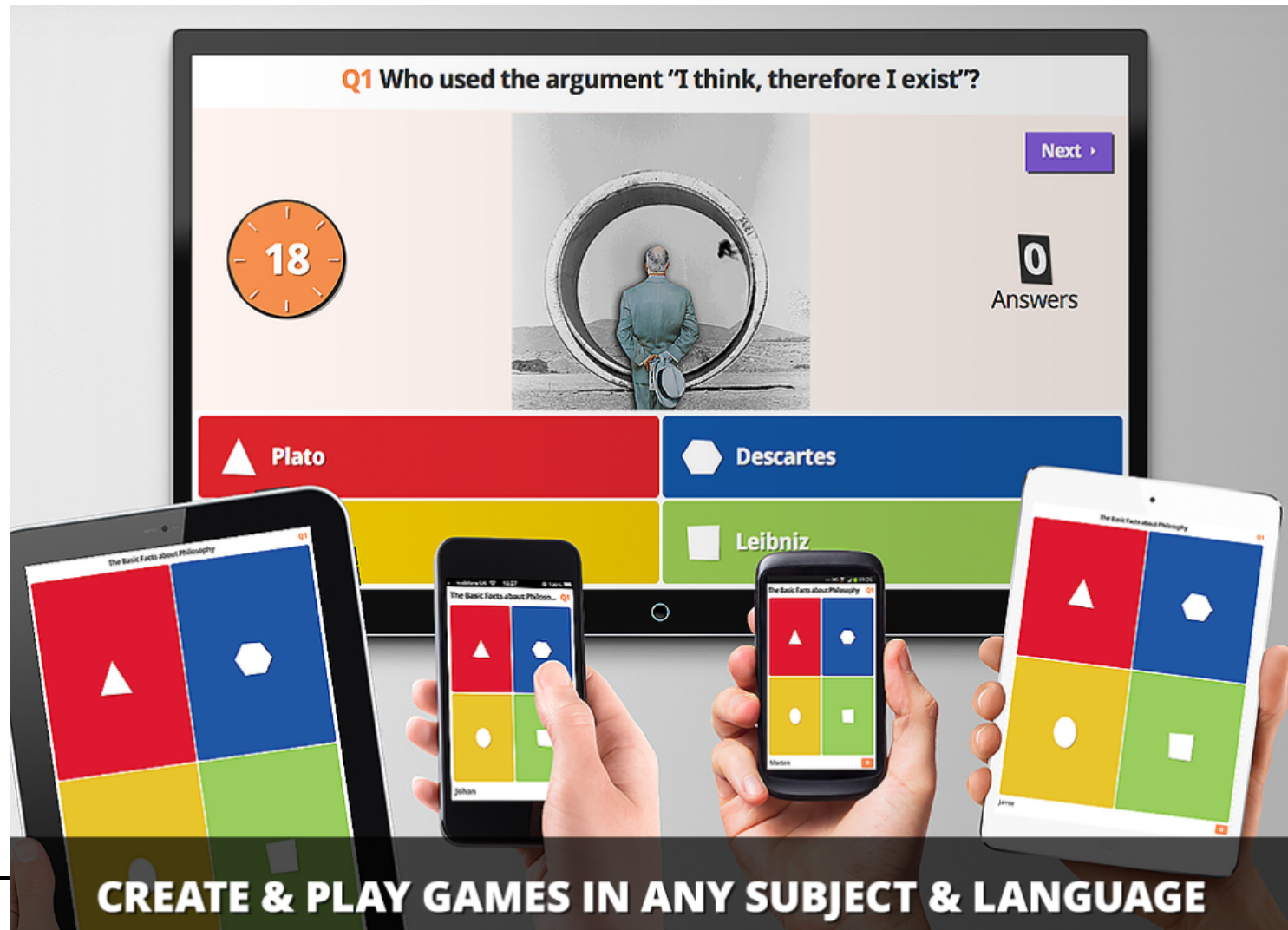


# Info about the most versatile animal on the planet – The Water Bear (*Tardigrades*)



Small segmented animal, 1mm, **EXTREMOPHILE**, present in peat moss-lichens, survived in space (LEO), 150°C, 272°C, 1200 atm, 5000 Gy (J/Kg), 10 year starvation

# Classroom activities - KAHOOT

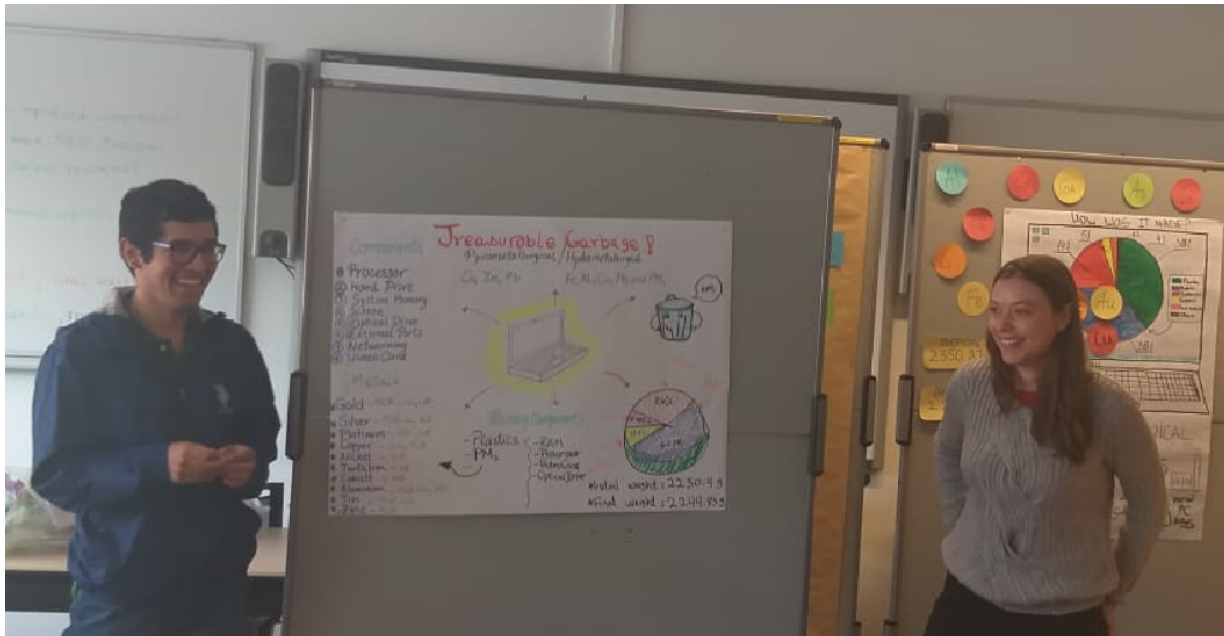


# Classroom activities - Hands on experience





## Classroom activities - Presentation

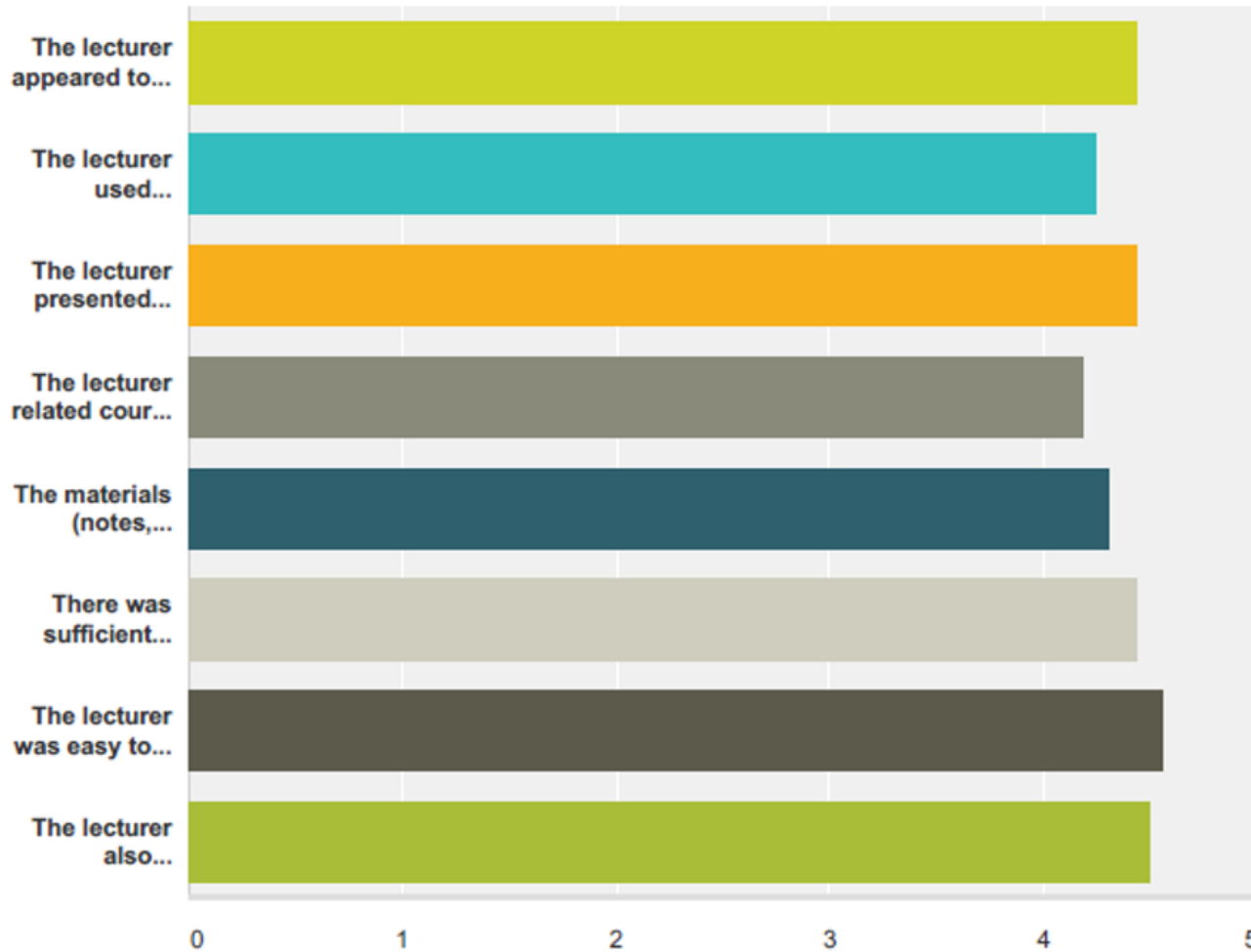




# Contents of a portfolio !

- 2 separate educational activities
- Description of your classes
- Description of your activating teaching methods
- Teaching materials: learning objectives, lesson plan, assessment matrix, assessment examples
- Student evaluations
- Self-reflection

# Student evaluation - > 4.0/5.0 (mandatory)

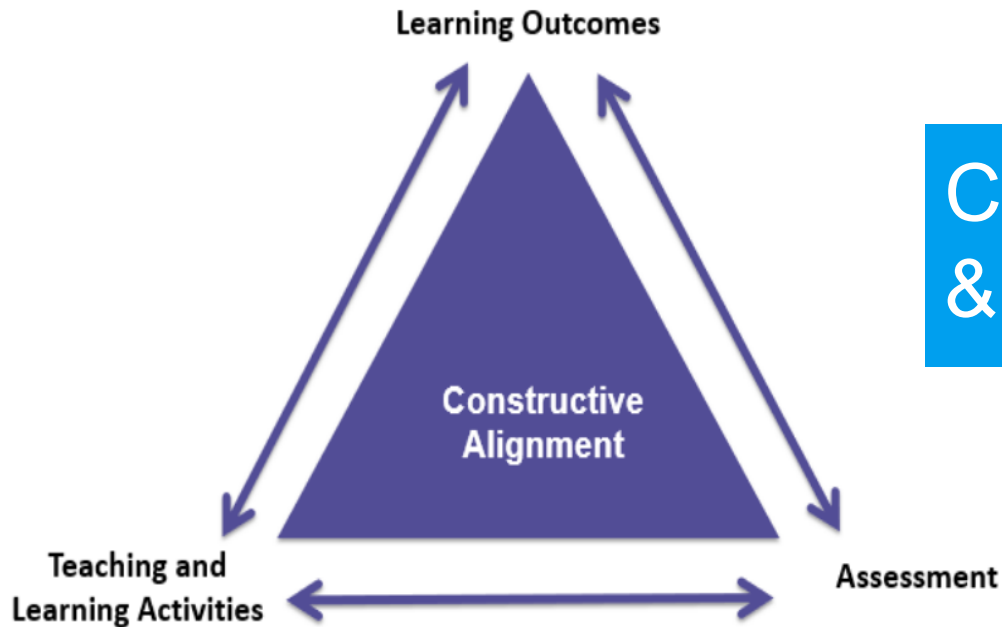


# Learning objectives to assessment matrix

Learning objectives	Written Exam (closed book): Wastewater treatment, air pollution control, environmental process technology and soil remediation	Assignment and presentations: Group work*	Report submission: Lab report**
Recall basic environmental microbiology and biotechnological applications for wastewater, waste gas and contaminated soils	√	√	√
Compare the efficiency of chemical and biological wastewater treatment processes and their practical applications	√	√	√
Categorize air pollutants and their adverse effects on the ambient air quality	√	√	
Distinguish between physico-chemical and biological air pollution control techniques for particulate control and gaseous contaminants	√	√	√
Inspect soil degradation patterns through an exploration of soil quality	√	√	√
Identify the impacts of soil pollution caused by heavy metals, inorganics, agrochemical and urban sources	√	√	
Examine through a one day field trip the functioning of a wastewater treatment plant, a waste gas treatment plant and wetland in the Netherlands		√	

**Note:** \*-Assignments will be submitted by the group members; \*\*-Submission of individual lab reports by the students

# Final outcome from an UTQ



Constructive alignment  
& self-reflection

why you should  
make time for  
self-reflection



hemsleyfraser

# For more information:



## CONTACT

**ERWIN PLOEGER**



Erwin Ploeger

Head of the  
Education Bureau

☎ +31152151758

✉ [e.ploeger@un-ihe.org](mailto:e.ploeger@un-ihe.org)



## CONTACT

**ERICK DE JONG**



Erick de Jong

Senior Policy  
Advisor Academic  
Affairs

☎ +31152151717

✉ [e.dejong@un-ihe.org](mailto:e.dejong@un-ihe.org)