A FLIPPED CLASS EXPERIENCE IN ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS.

LESSONS FROM FAILURE?

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Universitat de Girona

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Schedule

- Introduction
- Experience
  - Context of the subject
  - Work plan
- Results
  - Interests, difficulties, evaluations,…
- Discussion and conclusions

The flipped classroom

- Inverts the sequence of the activities in higher education:

teaching-studying-evaluation

studying-evaluation-teaching

It started in 2006 when Jonathan Bergman and Jonathan Sams started to develop videos of their Chemistry classes in Colorado

Advantages

Based on a review by Akçayır and Akçayır (2018)

- Improves learning performance (Bhagat et al. 2016)
- Satisfaction (Bösner et al. 2015)
- Engagement (Khanova et al. 2015)
- Flexible learning (Nguyen et al. 2016)
- More efficient class time (Davies et al. 2013)
- Positive feedback from students (Mylott et al. 2016)
- Interaction students - instructor (Ryan and Reid 2016)

Challenges

- Limited student preparation before class (Al-Zahrani 2015)
- Students need guidelines at home (Wanner and Palmer 2015)
- Unable to get help while out of class (Chen et al. 2015)
- Time consuming (Smith 2013)
- Workload increase (Khanova et al. 2015)
- Students do not prefer it (Porcaro et al. 2016)
- Teacher: time consuming (Wanner and Palmer 2015)
- Teacher: higher workload (Sage and Sele 2015)
- Quality of material (videos…) (Moraros et al. 2015)

Flipped classroom strategies

- Peer Instruction (Mazur 1997)
- Just in Time Teaching (Novak et al. 1999)
- Team Based Learning (Michaelsen et al. 2002)

Subjects of the 3rd year of Economics

Annual: Econometrics – 12 ECTS	
1st semester	2nd semester
Public economics	Contemporary economic history
Economics of the environment and natural resources	Macroeconomic analysis
Microeconomic analysis	Applied economics I
Economic policy I	Elective

Syllabus, EMARN

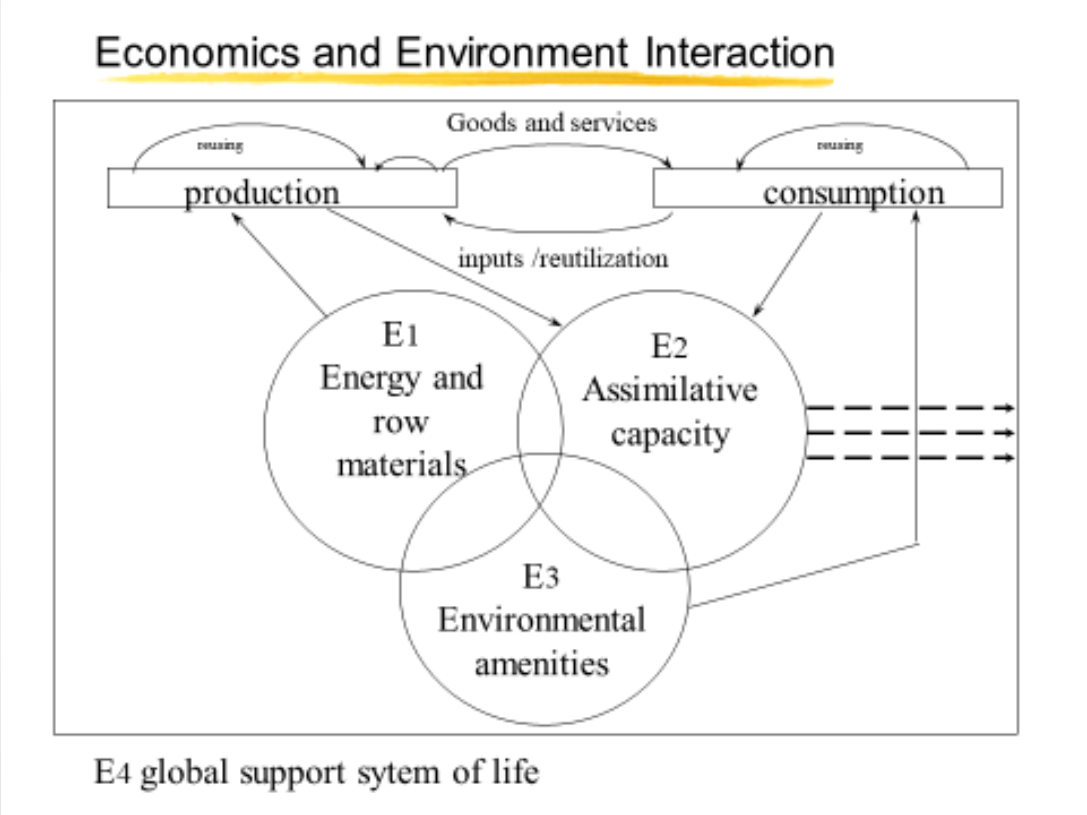
- Environmental policy instruments
- Techniques for measuring environmental benefits and costs
- Management of renewable and non-renewable resources

Activities and evaluation

Activity	Type	%
Individual exercises	Just in time methodology	30
Group exercises and case studies	Activities in the computer classroom	20
Exam	Composed of questions on theoretical aspects, as well as numerical exercises	50

Samples of activities

- Environmental paper. Google scholar. Read the abstract and introduction.



Price-Value

1

2

Hygrophorus eburneus

3

4

Activities

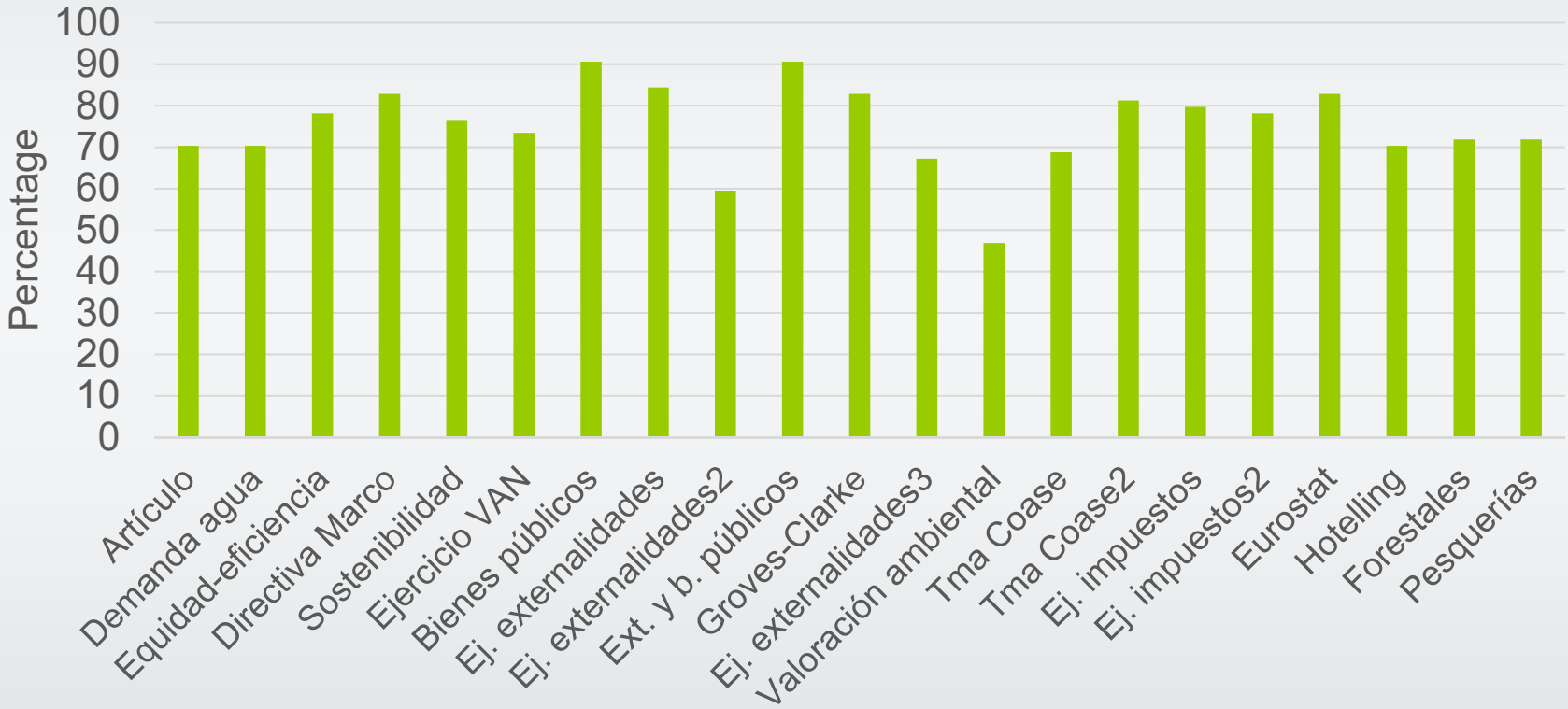
- Find a water bill. Study the consumption and pricing
- What did the last litre cost?
- What is the value of the last litre?
- Now suppose it's the third day you're here with nothing but the clothes you're wearing. What would you pay so that the camel wouldn't drink the litre of water and you could drink it?

- Draw the demand curve and the consumer surplus

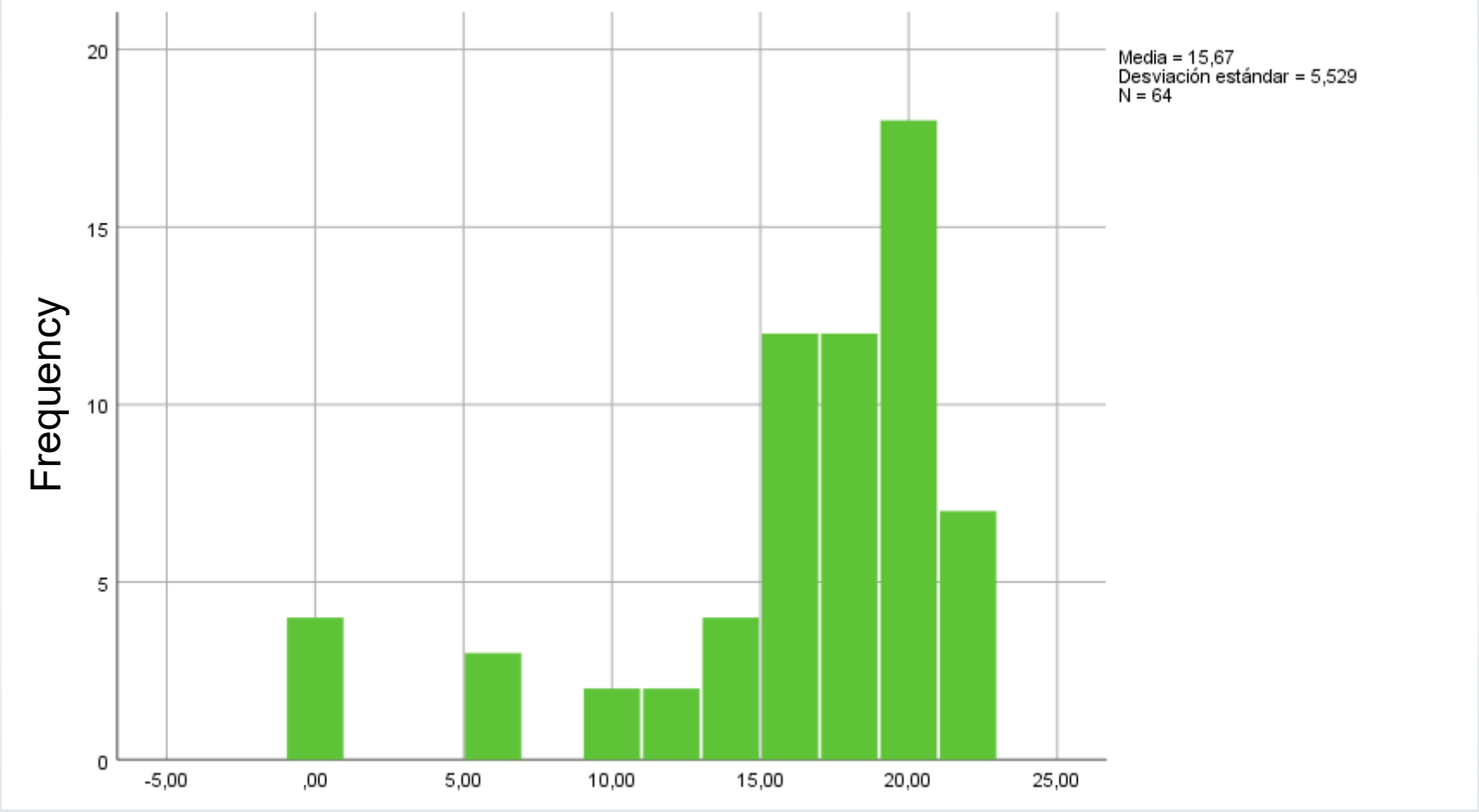
Data collected

- Usefulness of the exercise (1-5)
- Level of difficulty of the exercise (1-5)
- Time needed for resolution (minutes)
- Delivery, hours until the time limit
- Mark (0 to 10)
- Subject grades

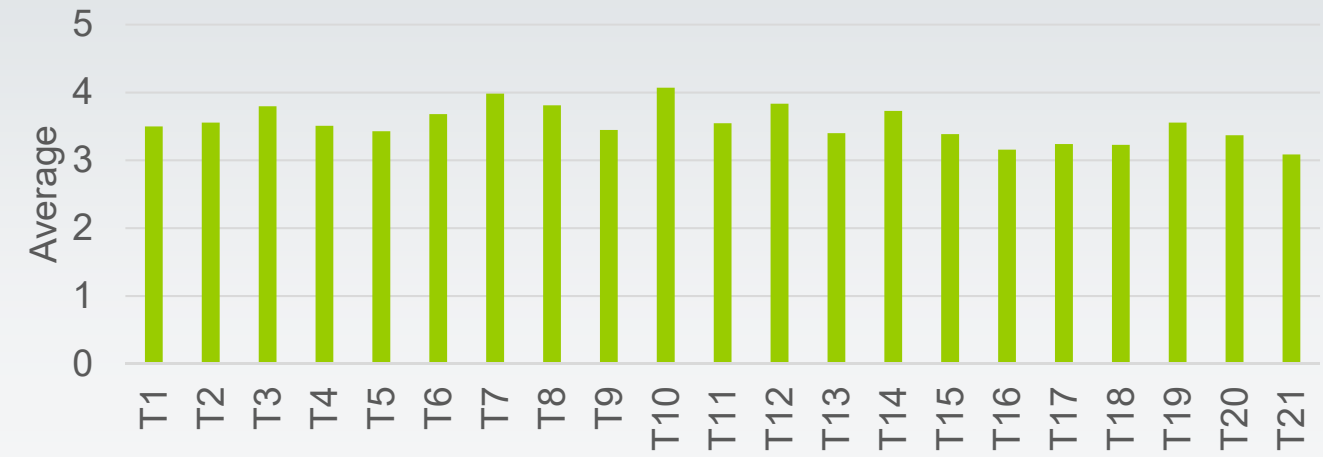
Students who performed the tasks



Number of tasks

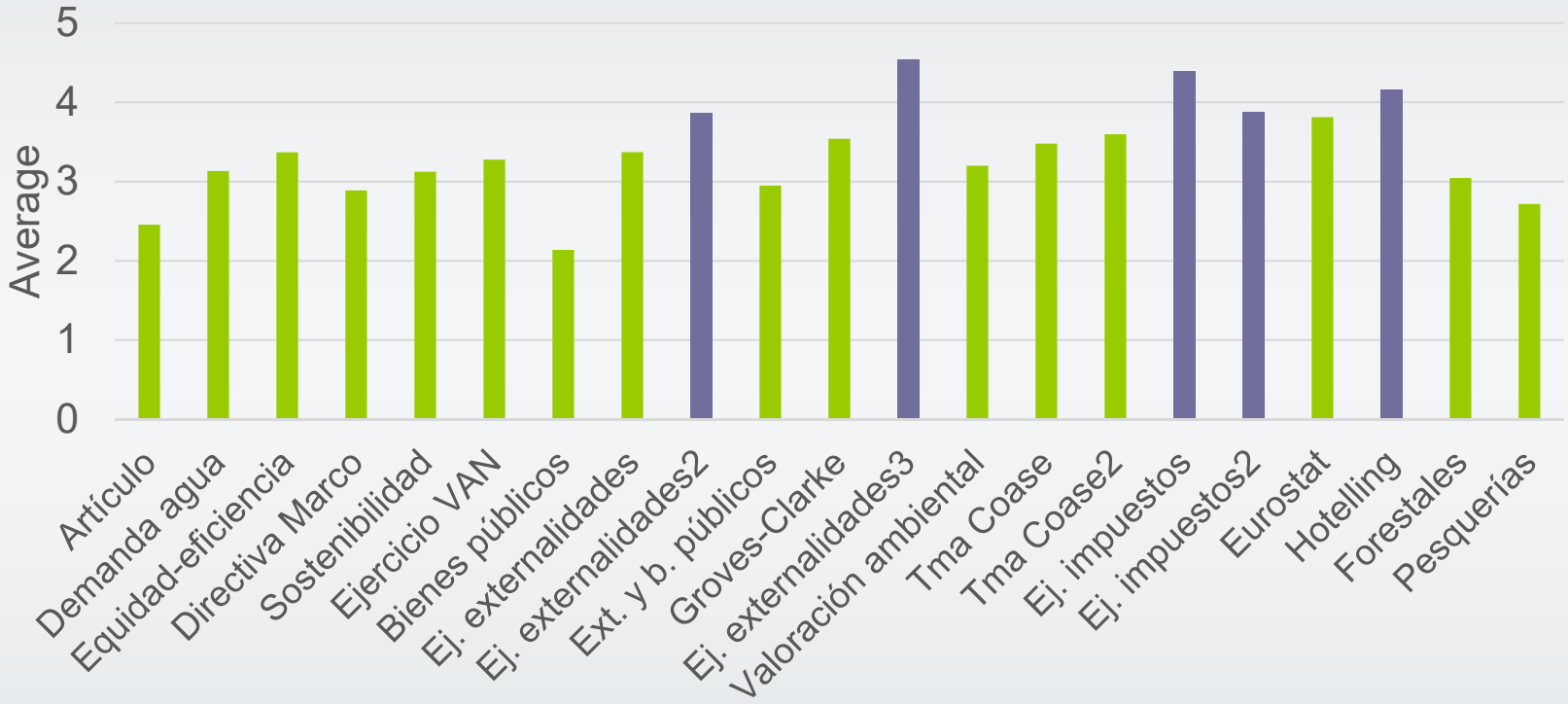


Usefulness

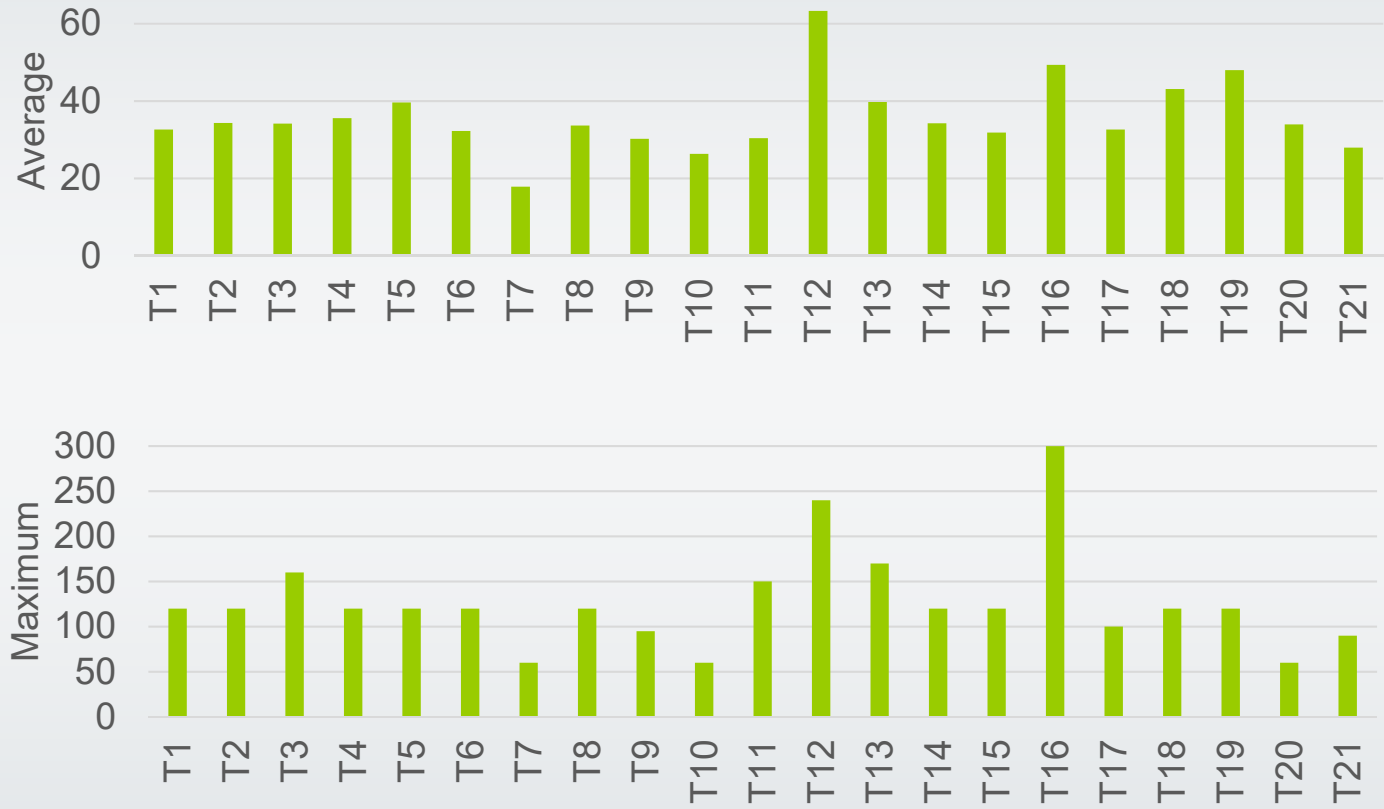

Average
5
4
3
2
1
0
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
T19
T20
T21


Percentage 4 & 5
80
70
60
50
40
30
20
10
0
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
T19
T20
T21

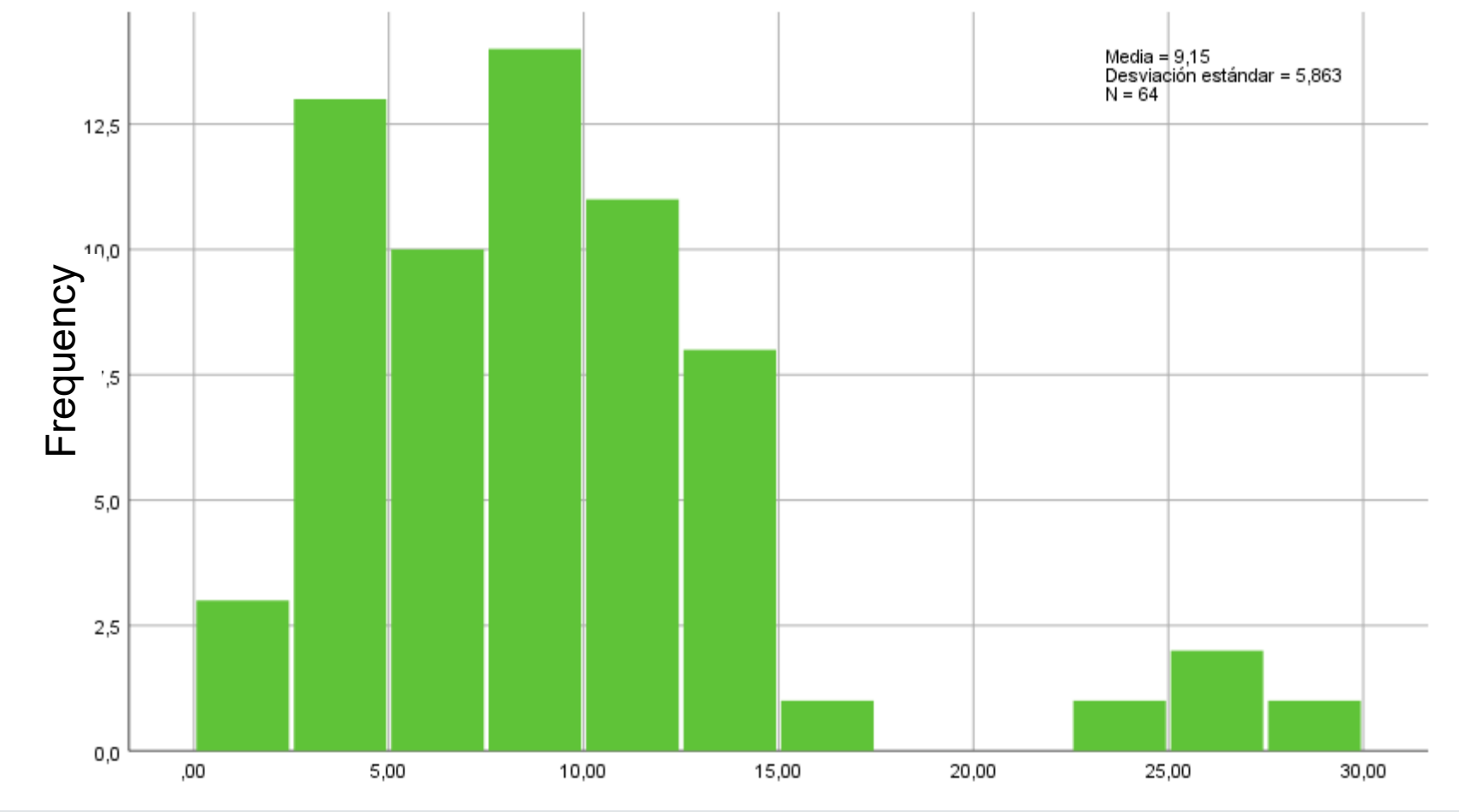
Difficulty


Average
5
4
3
2
1
0
Artículo
Demanda agua
Equidad-eficiencia
Directiva Marco
Sostenibilidad
Ejercicio VAN
Bienes públicos
Ej. externalidades
Ej. externalidades2
Ext. y b. públicos
Groves-Clarke
Ej. externalidades3
Valoración ambiental
Tma Coase
Tma Coase2
Ej. impuestos
Ej. impuestos2
Eurostat
Hotelling
Forestales
Pesquerías

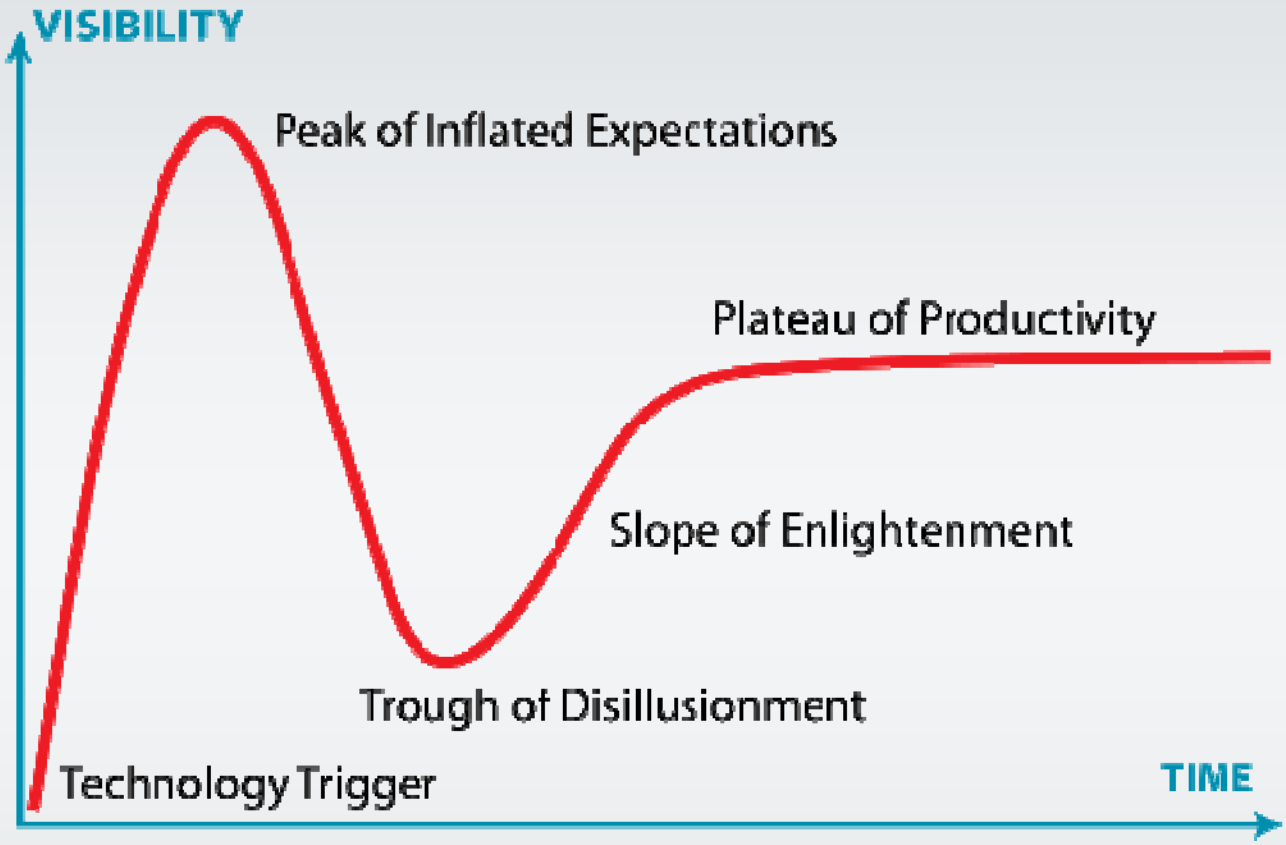
Time used for the tasks (minutes)



Total time (hours)



	Interest-Difficulty	Interest-Minutes	Interest-Marks	Difficulties-Minutes	Difficulty-Marks
1	*				(-) *
2			*		
4				*	
5				**	
6				*	(-) *
7					
8		*		**	
9	(-) *	(-) *	*	**	(-) *
10			*	**	
11				*	
12				**	
13					
14	*			**	
15				**	
16				*	
17				*	
18	*				
19					
22				*	
23	**	*		*	
24	**			**	



Hype cycle: Gartner

- Introducing a new methodology takes a lot of effort (obvious)
- Perhaps is not a good strategy to be (almost) the only one in a faculty applying a specific methodology
  - Introduction of active learning methodologies in a progressive way
- More flexibility in the tasks, balance out difficulty-time,….
- Carry out evaluation activities after the classes

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Thank you

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