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Universidades
Españolas

TIC



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Hacia la adopción de analítica de aprendizaje en instituciones de educación superior en Europa y Latino América

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Universidad Carlos III de Madrid



Importancia de los datos (I)

- *"Quite simply, knowledge is the engine of our economy. And data is its fuel."*



Neelie Kroes

Former Vicepresident
European Commission,
Responsible for Digital Agenda

Importancia de los datos (II)

- *"Data is a precious thing and will last longer than the systems themselves."*



Tim Berners-Lee

Director W3C

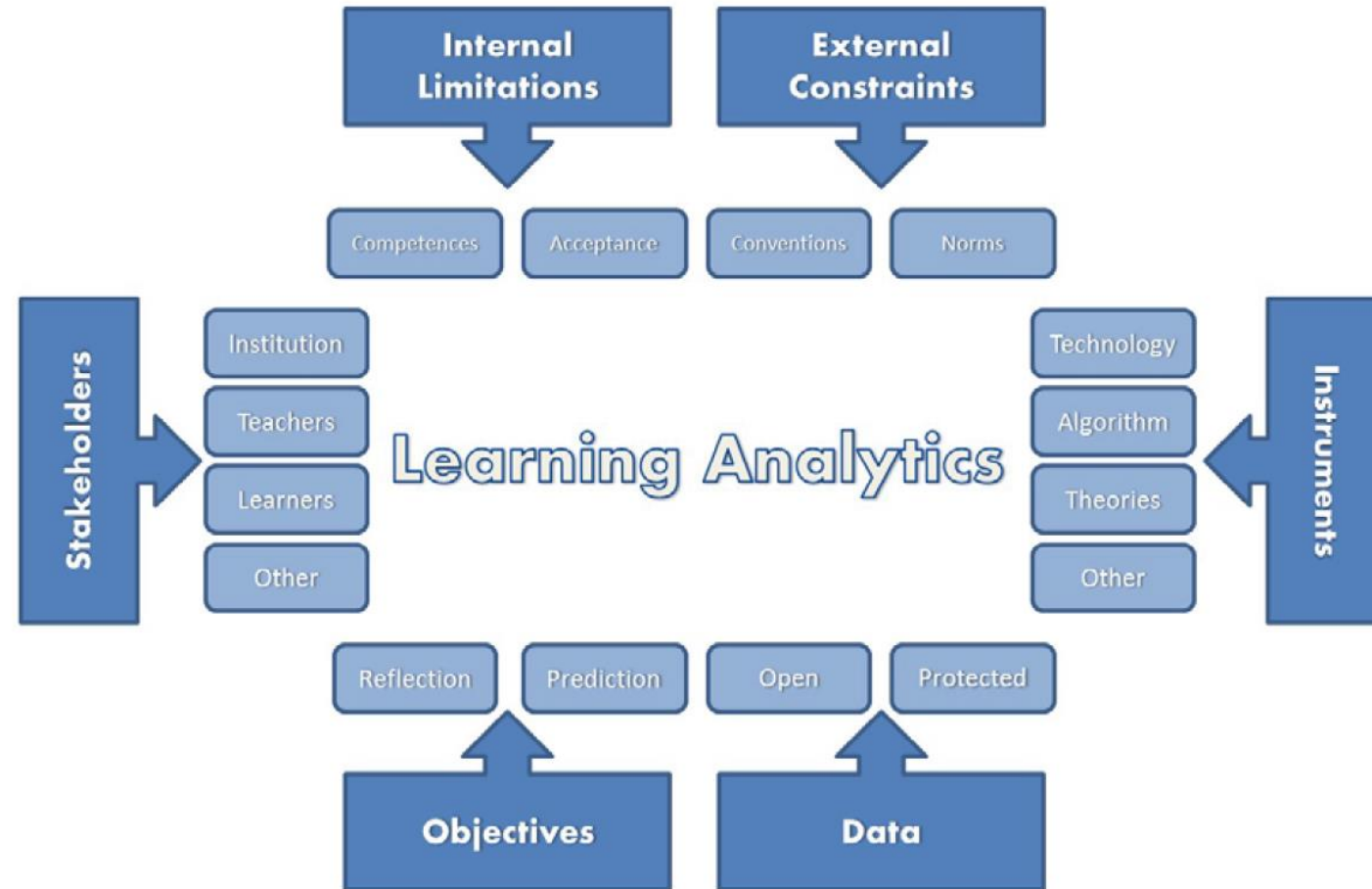
Inventor of the WWW

Importancia de los datos (III)

- Sector educativo

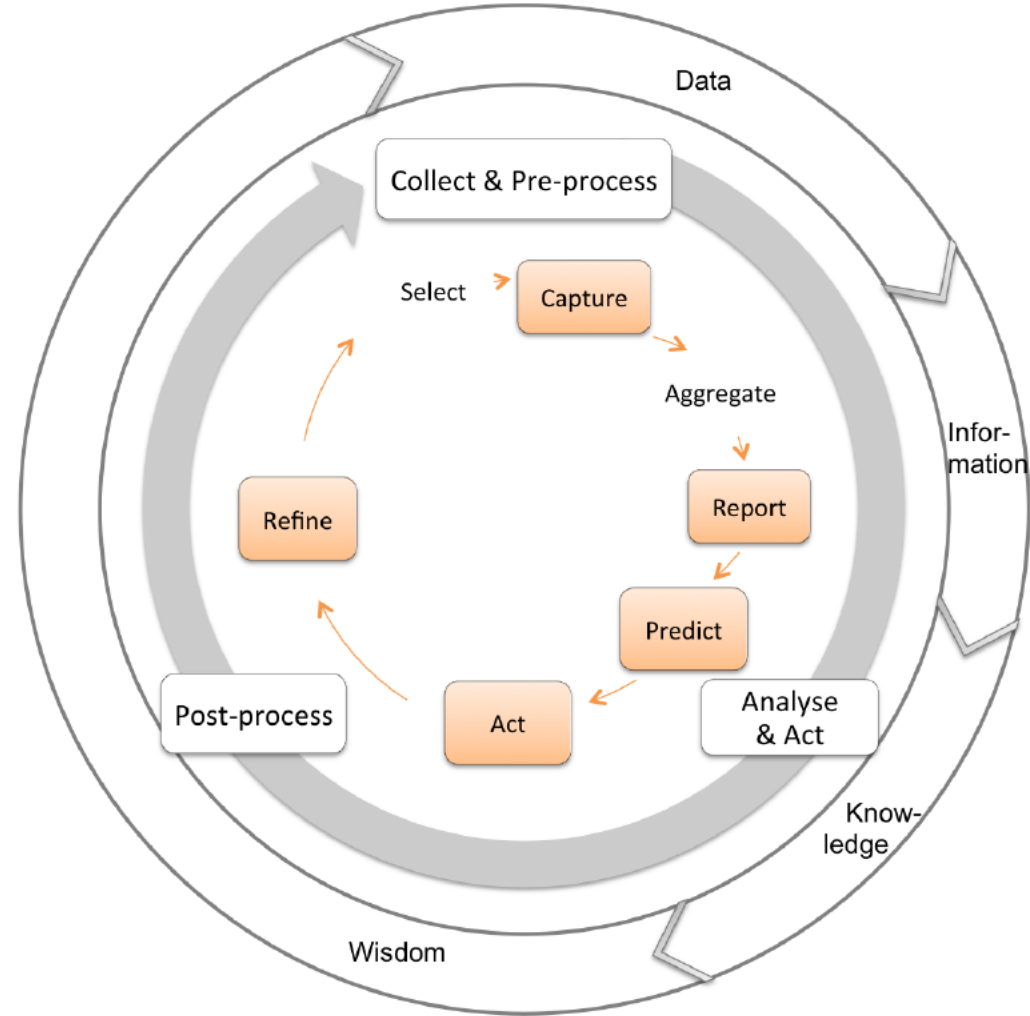
- Mejorar como aprenden los alumnos
- Mejorar interés de los alumnos
- Mejorar habilidades de los alumnos
- Mejorar a los profesores
- Toma de decisiones en la institución
- Mejorar los contenidos y las actividades
- Mejorar las metodologías y pedagogías
- Poder abarcar a un mayor número de personas

Analítica de aprendizaje (I)



Greller, W. & Drachsler, H. (2012). Translating learning into numbers: A generic framework for learning analytics. *Educational Technology & Society*, 15(3), 42-57.

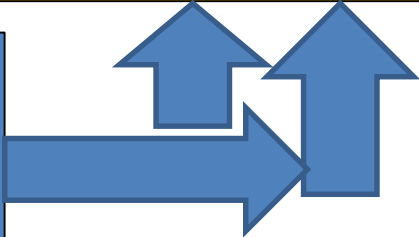
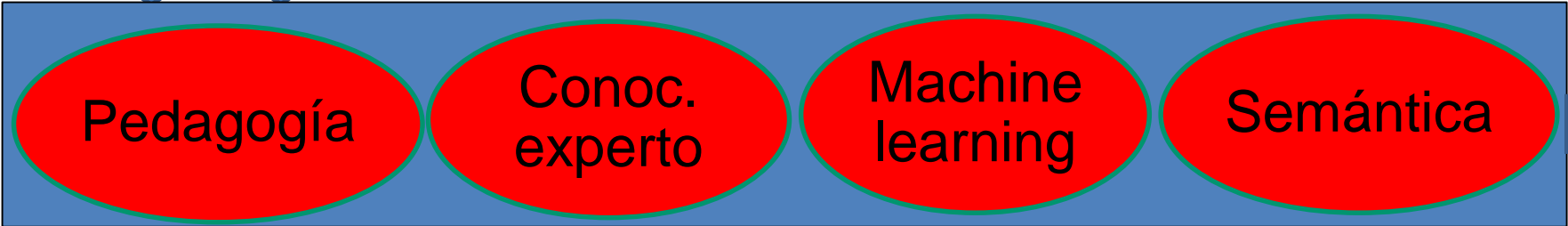
Analítica de aprendizaje (II)



Steiner, C., Kickmeier-Rust, M., Türker, M. A. (2014). Review Article about LA and EDM Approaches, Deliverable D3.1 – LEA's Box Project, <http://css-kmi.tugraz.at/mkrwww/leas-box/downloads/D3.1.pdf>

Inferencia de información inteligente

Imagen tomada de <http://www.datadial.net/blog/index.php/2011/08/24/why-your-website-isnt-as-fast-as-it-should-be/>



Sistemas de visualización (I)



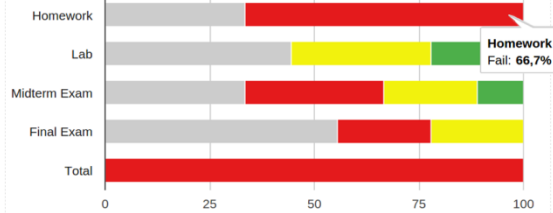
Sistemas de visualización (II)

DASHBOARD FOR INSTRUCTORS

PROBLEM VISUALIZATIONS VIDEO VISUALIZATIONS COURSE ACTIVITY VISUALIZATIONS

Course Summary

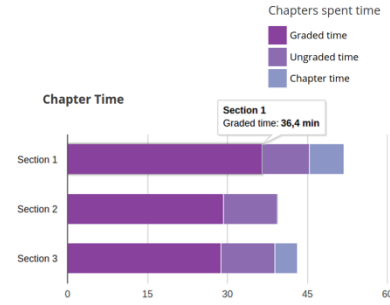
This visualization shows the percentage of students which have achieved proficiency, passed, failed or not accessed each category of resource in the course. Click on one of the bars in order to see the results decomposed in each item within the category.



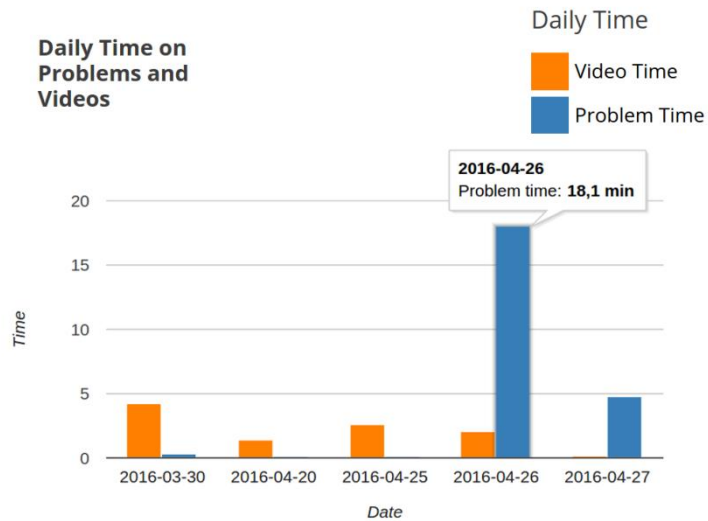
Grade categories

- Proficiency
- OK
- Fail
- Not done

Chapter Time



Daily Time on Problems and Videos



Daily Time

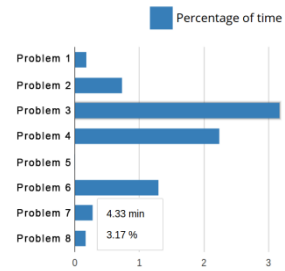
- Video Time
- Problem Time

Problem Time Distribution

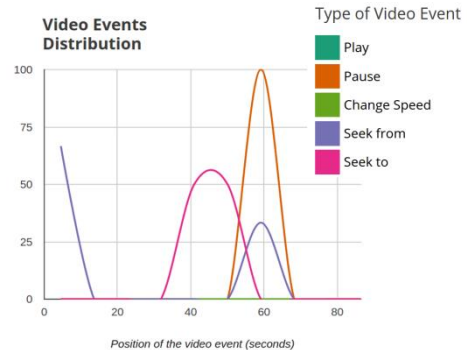
This visualization shows the percentage of time invested in minutes in each one of the problems of the course. You can filter by all the students or each student individually.

- Options: All students, Range of problems
- Problem 1
 - Problem 2
 - Problem 3
 - Problem 4
 - Problem 5
 - Problem 6
 - Problem 7
 - Problem 8
- Draw again

Problem time



Video Events Distribution



Repetitions of Video Intervals

This visualization shows the number of different times that each second of a video have been watched by all the class. You can select two different options; either each student can count only 1 time, or each student can count up to the number of times that he/she has watched that video second. You can also pick students individually.

Options

- paloma
- Videos
- Video 1

Video Time Watched

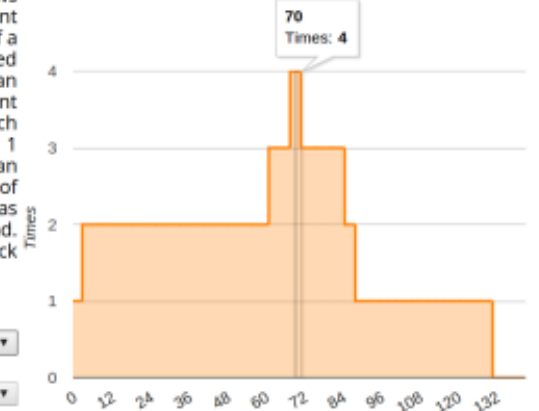
This visualization shows in light orange the percentage of different video watched (it does not count if the same parts are watched several times, the max. is the 100% of the video) and in dark orange the percentage of total video watched (total amount of time spent compared to the length of the video in percentage). You can filter by all the students or each student individually.

Options

- paloma
- Range of videos
- Video 1
 - Video 2
 - Video 3
 - Video 4
 - Video 5
 - Video 6
 - Video 7
 - Video 8
- Draw again

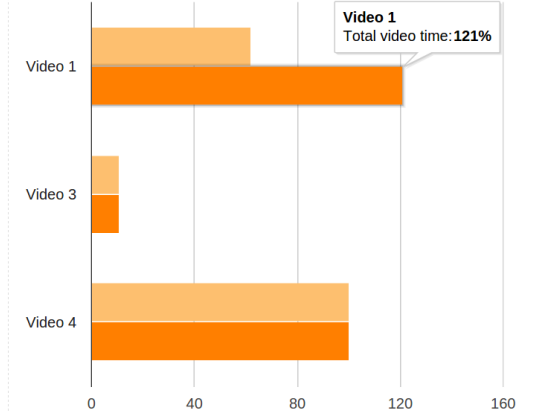
Repetitions

- Number of Times



Video Time Watched

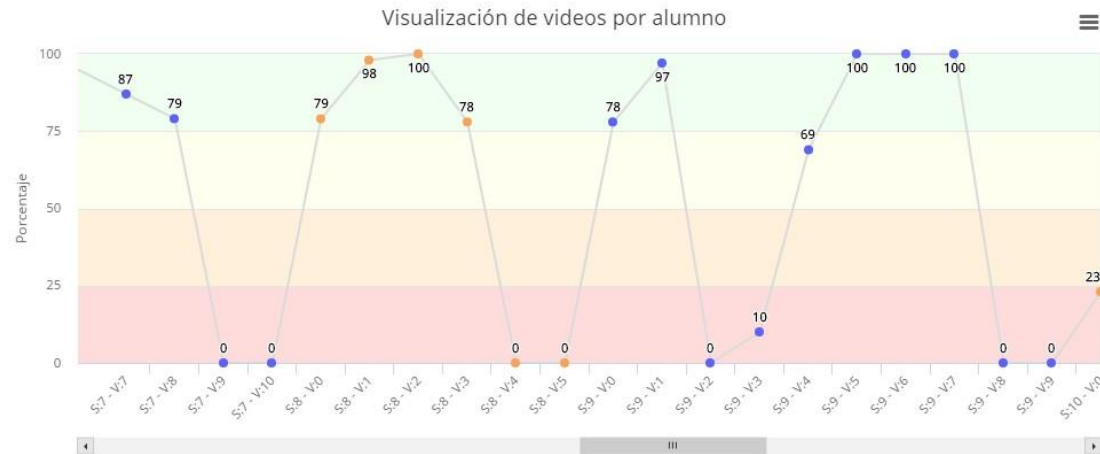
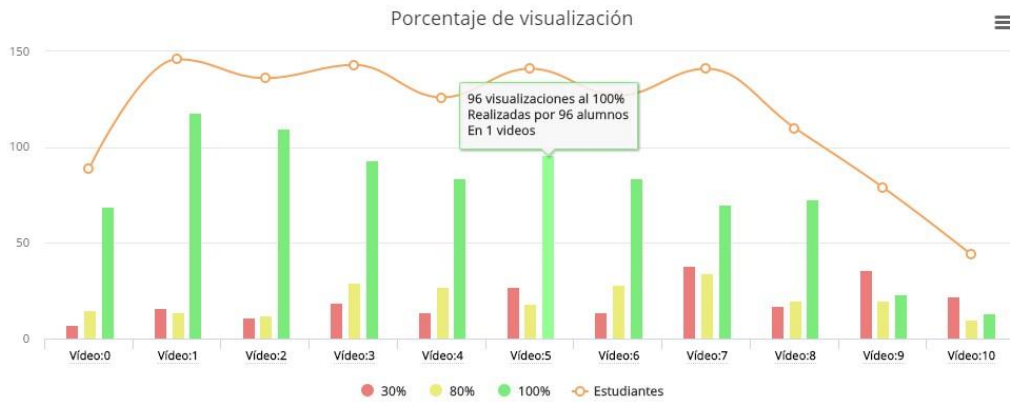
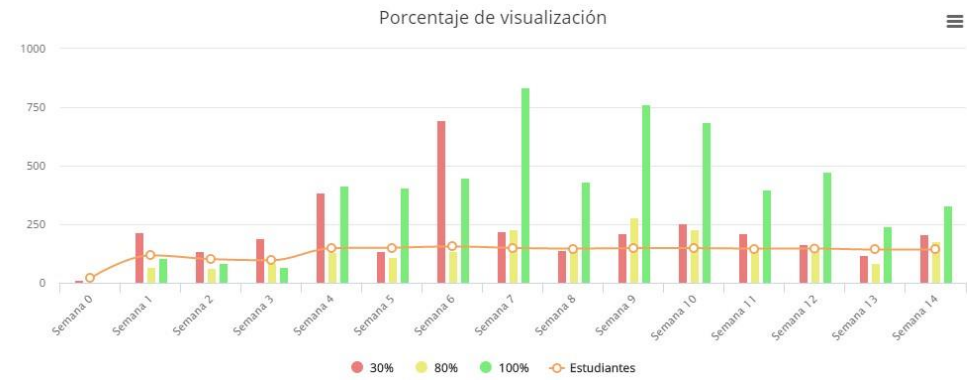
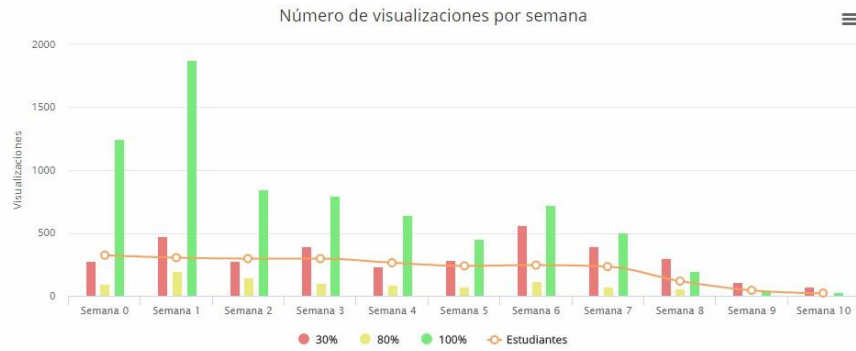
- Different Video Time
- Total Video Time



Problemas en la adopción

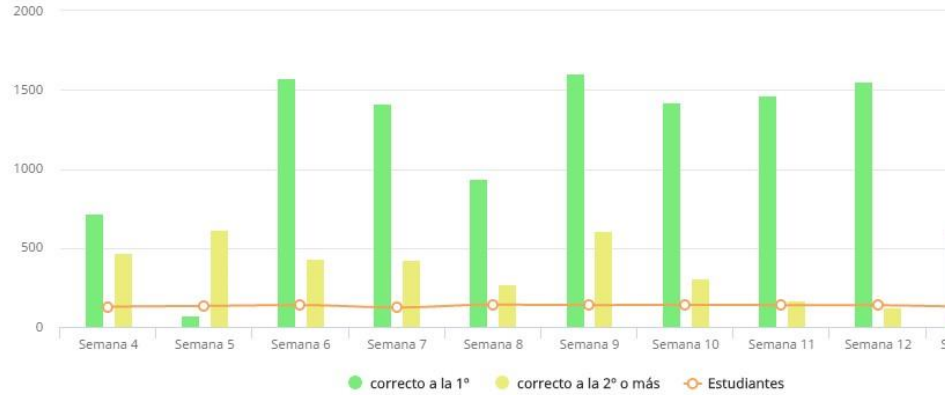
Dar el salto entre la
investigación y la
puesta en práctica
por una institución

Analítica aprendizaje en UC3M (I)



Analítica aprendizaje en UC3M (II)

Porcentaje de ejercicios resueltos

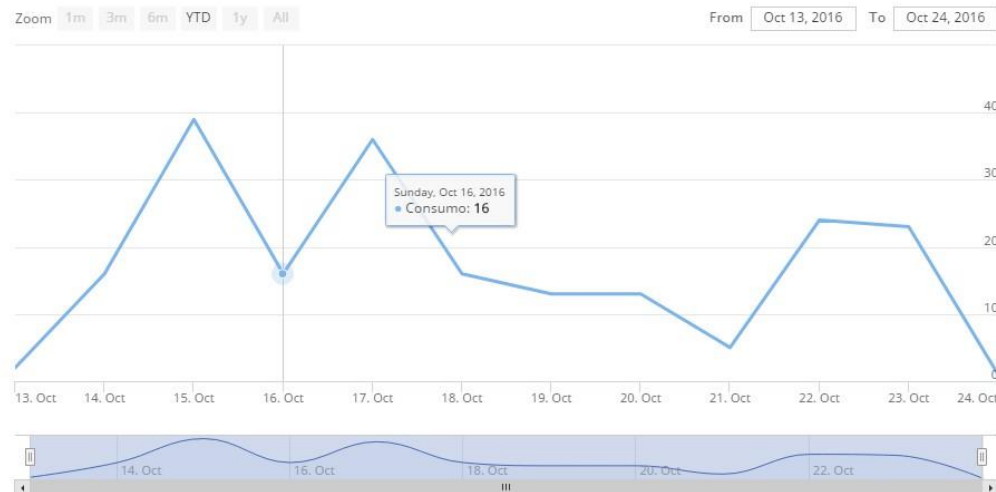


Porcentaje de ejercicios resueltos

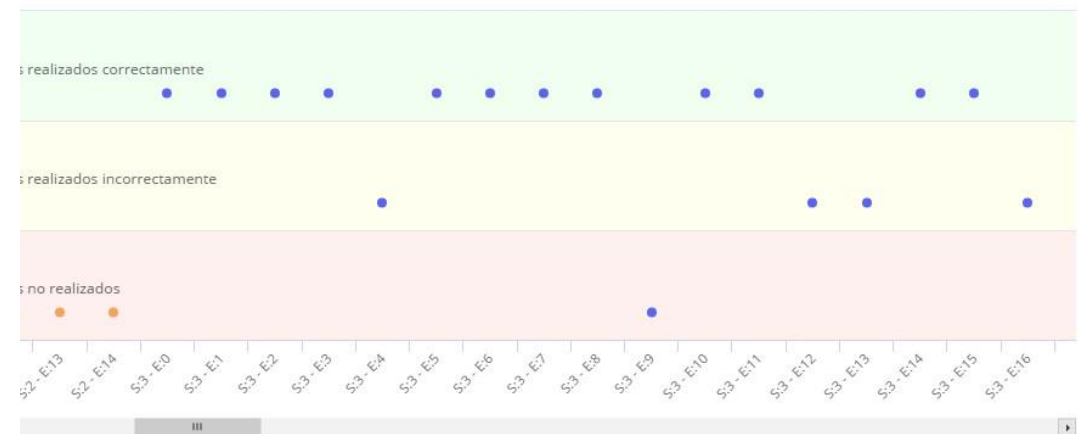


Ejercicio 0

Consumo de un ejercicio por fecha



Realización de ejercicios por alumno

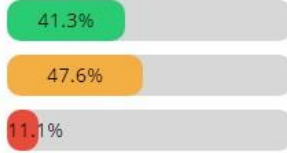


Analítica aprendizaje en UC3M (III)

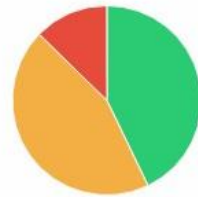
Grupo Docente: Todos



ESFUERZO



Highcharts.com



NOTAS



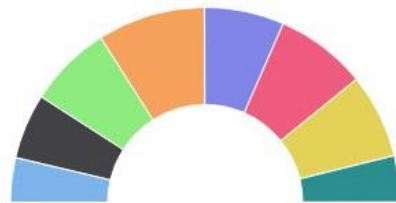
Highcharts.com

▸ Alumnos en situación de riesgo

▸ Alumnos en situación de mejora

▸ Alumnos en situación excelente

Carga teórica de trabajo



- Tema 1. La cultura ágil
 - Tema 2. Principios de la Ingeniería software ágil
 - Tema 3. El proceso de desarrollo ágil
 - Tema 4. De la idea al concepto
- ▲ 1/3 ▼

Trabajo teórico vs Trabajo real



- Trabajo teórico (Gráfico externo)
- Trabajo real (Gráfico interno)



- Tema 1. La cultura ágil
 - Tema 2. Principios de la Ingeniería software ágil
 - Tema 3. El proceso de desarrollo ágil
 - Tema 4. De la idea al concepto
- ▲ 1/2 ▼

Alumnos en situación de riesgo



▸ Alumnos en situación de mejora

▸ Alumnos en situación excelente



SHEILA project

<http://sheilaproject.eu/>

Equipo



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Maren Scheffel (OUNL)

Ioana Jivet (OUNL)

Tobias Ley (U. Tallin)

Kairit Tammets (U. Tallin)

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Pedro J. Muñoz-Merino (UC3M)

Pedro M. Moreno Marcos (UC3M)

Aaron Rubio Fernández (UC3M)

Metodología



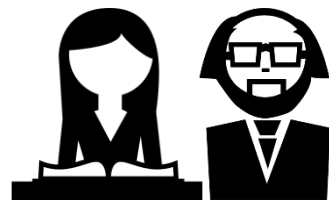
Literatura

- Políticas
- Adopción



Alumnos

- Encuesta
- Focus groups



Profesores

- Encuesta
- Focus groups



Senior managers

- Survey
- Interviews



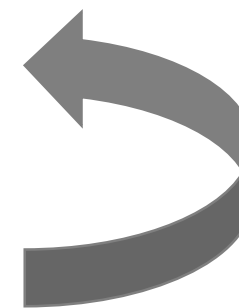
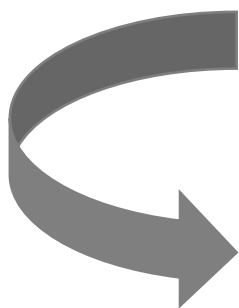
Expertos

- Mapeo de conceptos de grupo



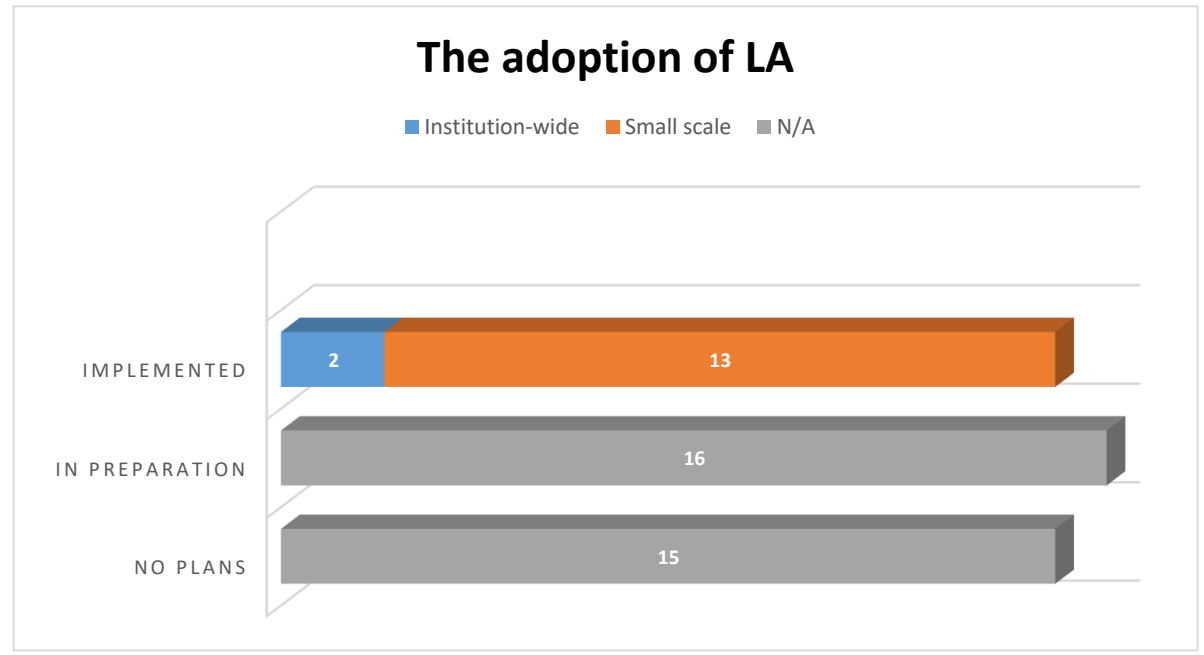
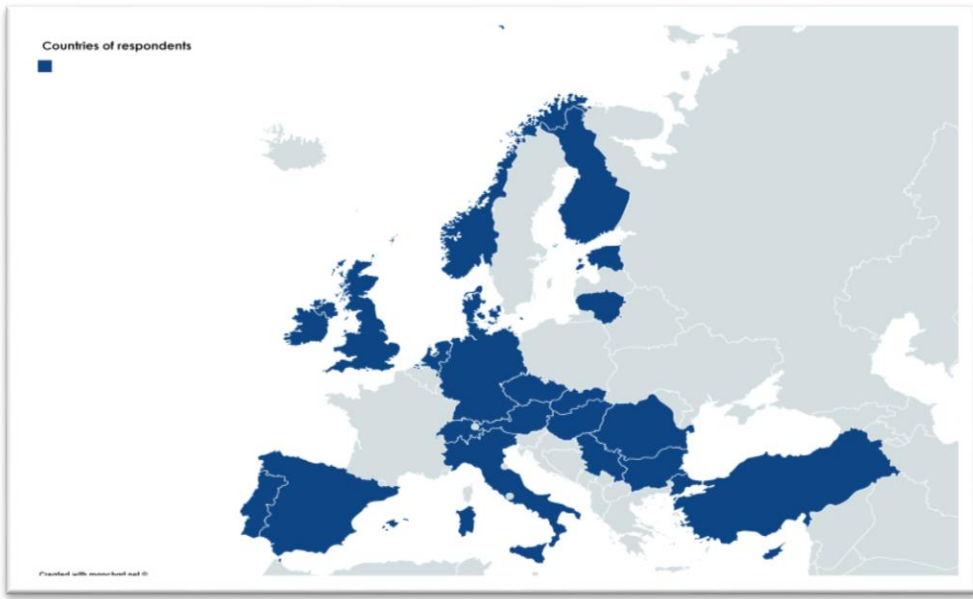
Otros actores

- Workshops
- Comités



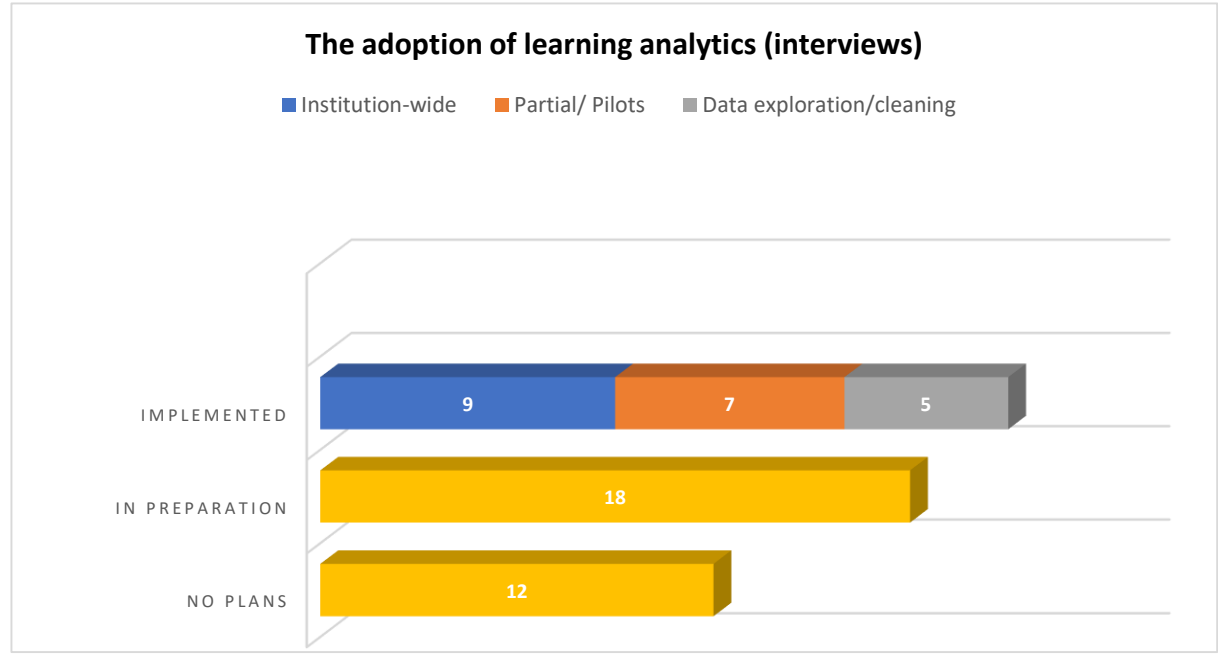
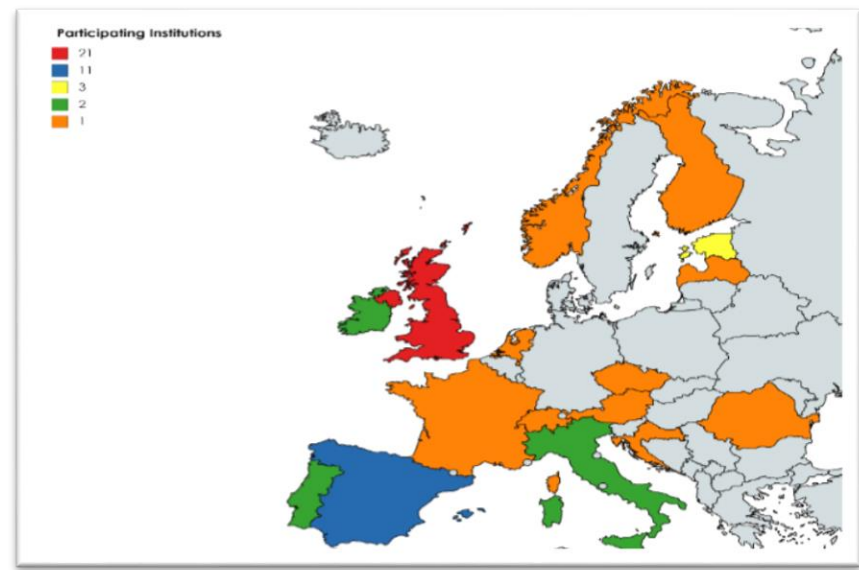
Encuesta

- 22 países, 46 instituciones
- Noviembre 2016



Entrevistas

- 16 países, 51 HEIs, 64 entrevistas, 78 participantes
- Agosto 2016 - Enero 2017



Barreras para el éxito de la analítica del aprendizaje

- Tener conocimiento experto sobre analítica de aprendizaje - 76%
- Cultura basada en los datos en la institución - 67%
- Que reconozcan su importancia los profesores - 64%
- Las funcionalidades de las actuales herramientas tecnológicas de analítica de aprendizaje - 64%

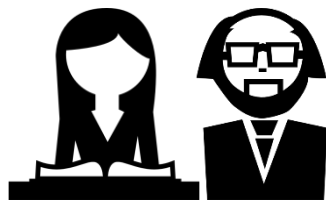
Methodology



Literature
- Policy
- Adoption



Students
- Survey
- Focus groups



Academic staff
- Survey
- Focus groups



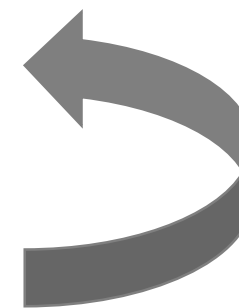
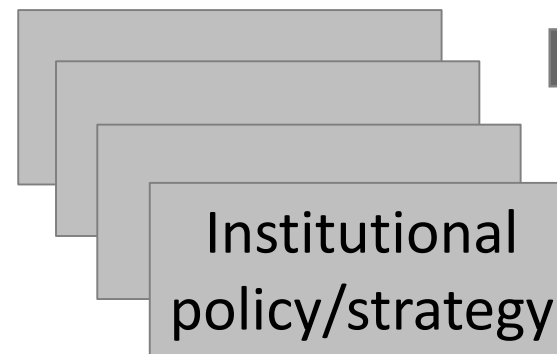
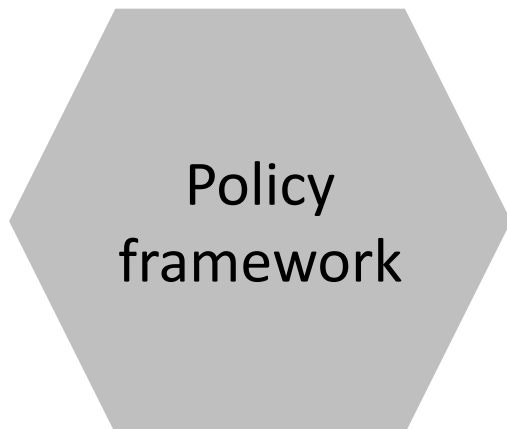
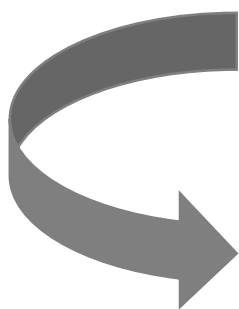
Senior managers
- Survey
- Interviews



Experts
- Group concept mapping



Other stakeh.
- Workshops
- Committees

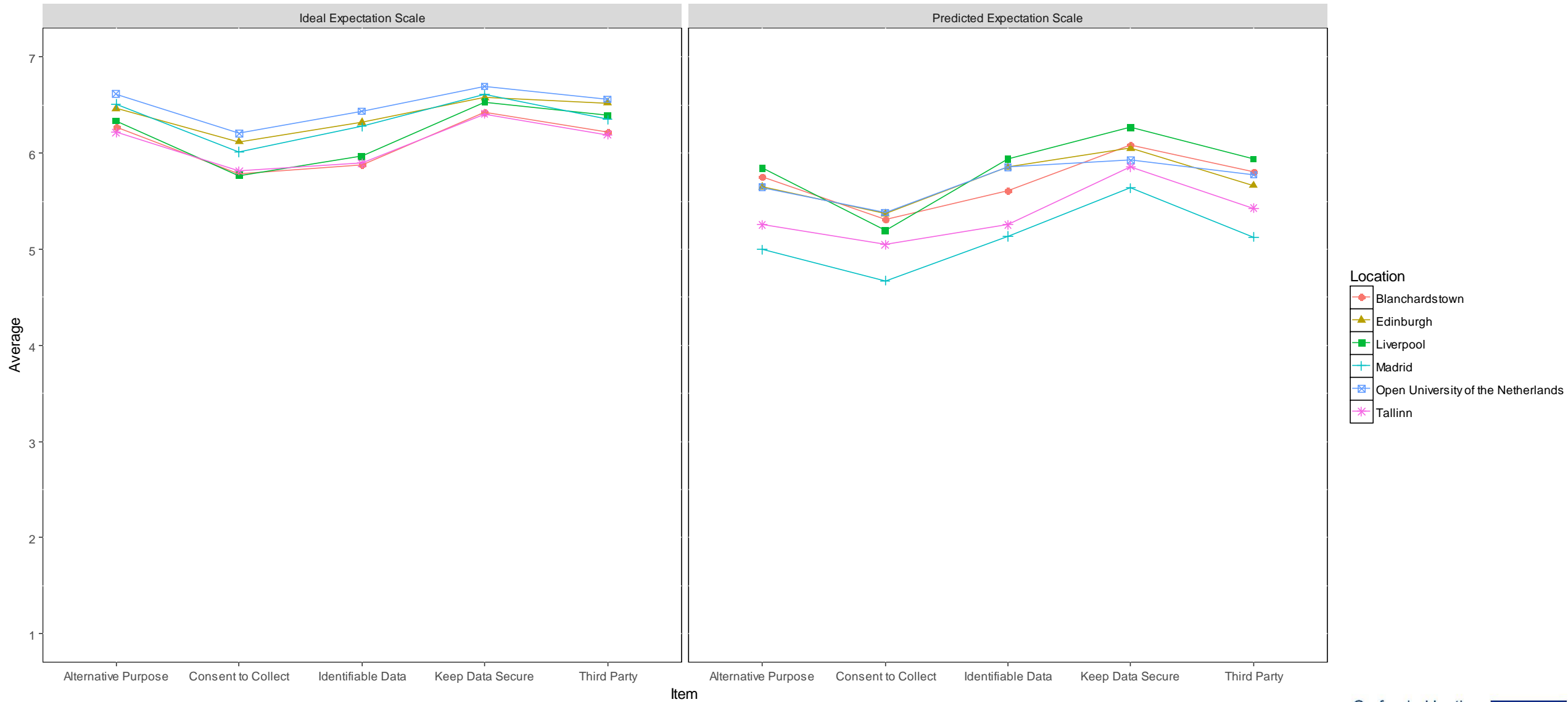


Datos de la encuesta a alumnos

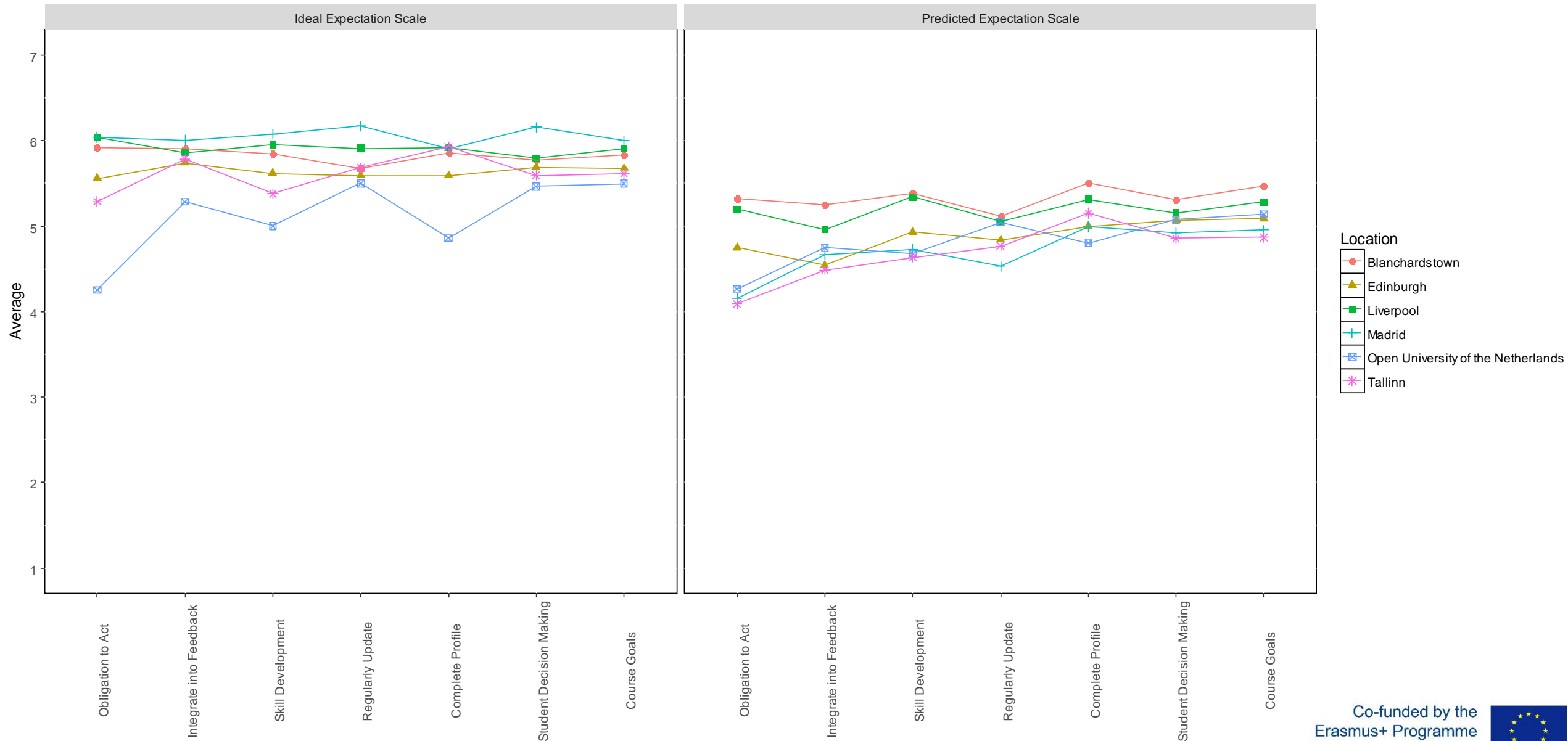
- 12 aspectos de expectativas, con dos dimensiones: ideal, real
- Dos grandes grupos:
 - Ética y privacidad
 - Funcionalidades del servicio
- 6 universidades:
 - Edinburgh ($N = 884$)
 - Liverpool ($N = 191$)
 - Tallinn ($N = 161$)
 - Madrid ($N = 543$)
 - Netherlands ($N = 1247$)
 - Blanchardstown ($N = 237$)



Expectativas de ética y privacidad



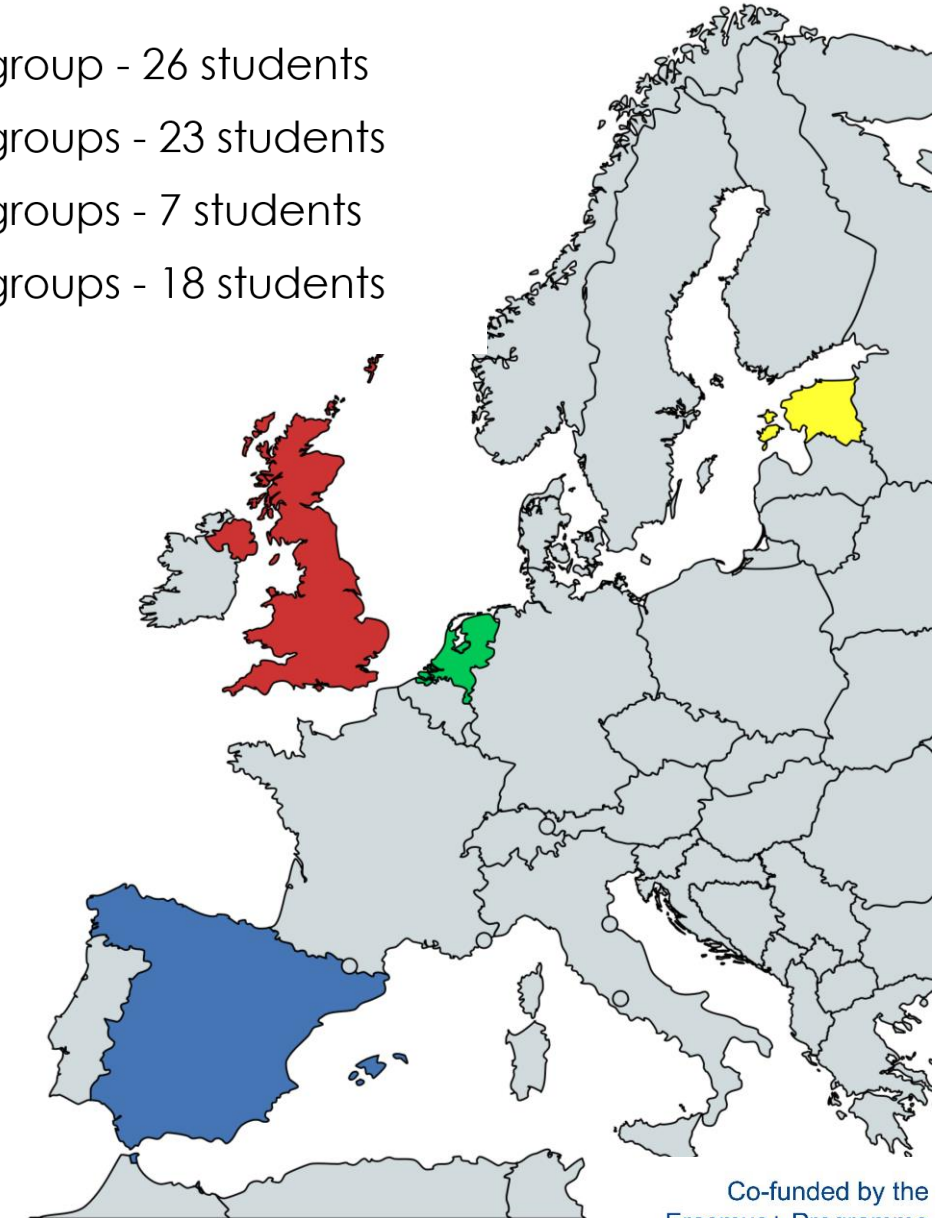
Expectativas del servicio



Datos de focus groups a alumnos

- 18 focus groups
- 4 universidades
- 74 alumnos
- Entrevistas: Sobre 1h

- 6 focus group - 26 students
- 5 focus groups - 23 students
- 2 focus groups - 7 students
- 5 focus groups - 18 students



Intereses y expectativas

- Mejorar la calidad de la enseñanza
- Mejor realimentación de profesor a alumno
- Mejores recursos académicos y herramientas académicas para mejorar el aprendizaje
- Apoyo personalizado
 - Recomendación de recursos de aprendizaje
 - Realimentación del Sistema, por medio de panels de visualización
- Proporcionar un resumen de las tareas realizadas en en semestre → mejorar el diseño del curriculum



Conciencia

- Los alumnos no saben lo que es la analítica del aprendizaje, pero reconocen su importancia cuando se les explica y reconocen que puede resolver problemas de los alumnos
- Los alumnos no son conscientes en general de los datos recopilados →
Transparencia
- Los alumnos no se han detenido a leer las condiciones que han aceptado sobre sus datos

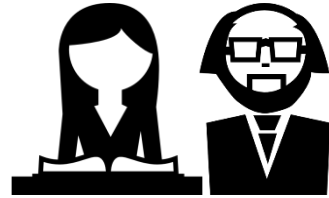
Methodology



Literature
- Policy
- Adoption



Students
- Survey
- Focus groups



Academic staff
- Survey
- Focus groups



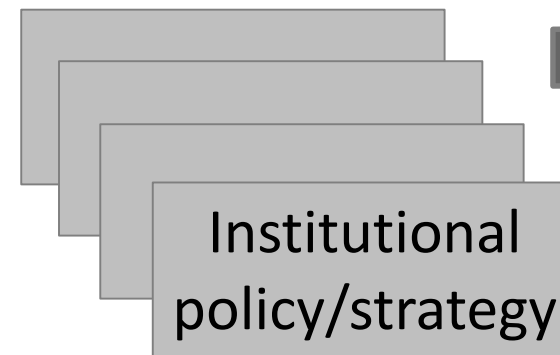
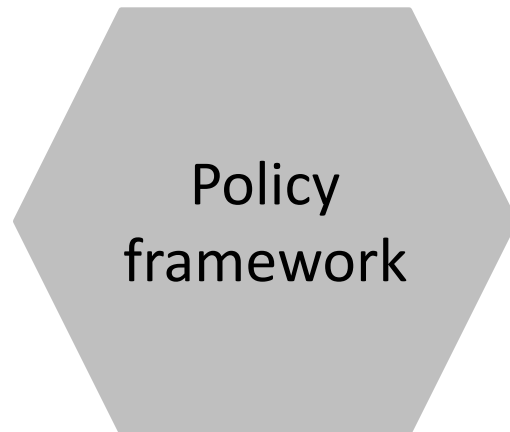
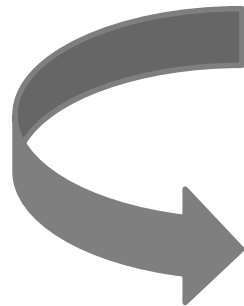
Senior managers
- Survey
- Interviews



Experts
- Group concept
mapping



Other stakeh.
- Workshops
- Committees





Encuestas a profesores

University of Edinburgh

n = 81

Universidad Carlos III Madrid

n = 26

Open Universiteit

n = 54

University of Tallinn

n = 49

Durante 2017



Valores máximos

Universidad Carlos III de Madrid:

- **Ideal:** La analítica del aprendizaje se presentará en un formato que es sencillo y fácil de entender ($M = 6.31$) Q11
- **Predecible:** La analítica presentará a los alumnos un perfil completo de su aprendizaje a lo largo de los diferentes cursos ($M = 5.27$) Q12



Valores mínimos

University of Edinburgh:

- **Ideal:** Los profesores tendrán la obligación de actuar si se detecta que los alumnos están en riesgo de suspender o de tener un bajo rendimiento ($M = 3.65$) Q14
- **Predecible:** Los profesores serán competentes de incorporar analíticas en el feedback y ayuda a proporcionar a los alumnos ($M = 3.49$) Q13

Universidad Carlos III de Madrid:

- **Ideal:** Los profesores tendrán la obligación de actuar si se detecta que los alumnos están en riesgo de suspender o de tener un bajo rendimiento ($M = 4.42$) Q14
- **Predecible:** Los profesores tendrán la obligación de actuar si se detecta que los alumnos están en riesgo de suspender o de tener un bajo rendimiento ($M = 3.77$) Q14



Focus groups de profesores

- **University of Edinburgh:** 5 focus groups, 18 profesores
- **Universidad Carlos III de Madrid:** 4 focus groups, 16 profesores
- **Open Universiteit Nederland:** 2 focus groups, 5 profesores
- **Tallinn University:** 5 focus groups, 20 profesores

Resultados: preocupaciones – nivel alumnos



Resultados: preocupaciones – nivel alumnos



Hi. I don't care. Thanks.

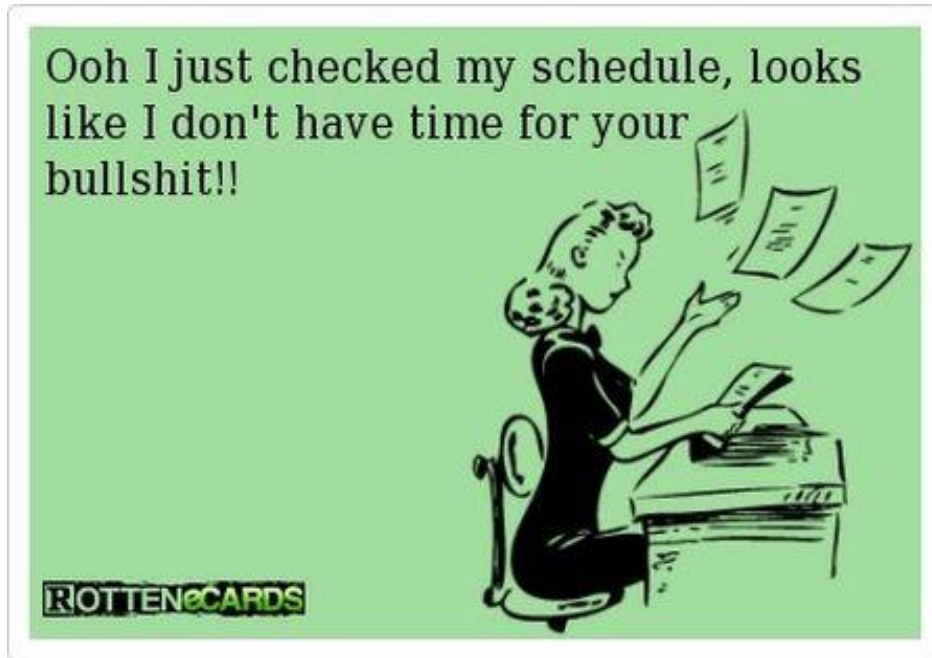


your  cards
someecards.com

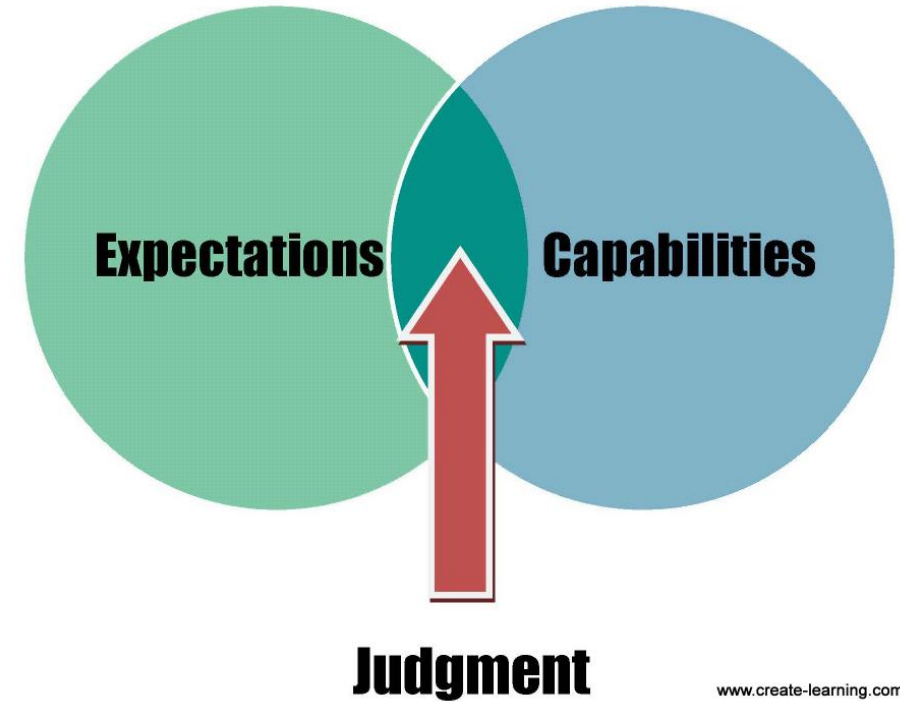
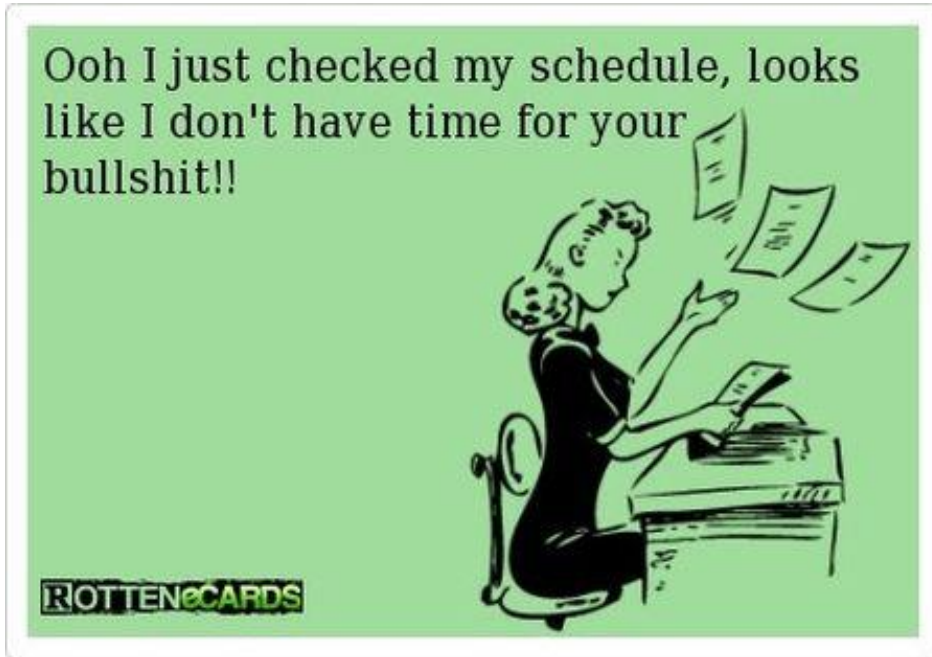
Resultados: preocupaciones – nivel alumnos



Resultados: preocupaciones – nivel profesor



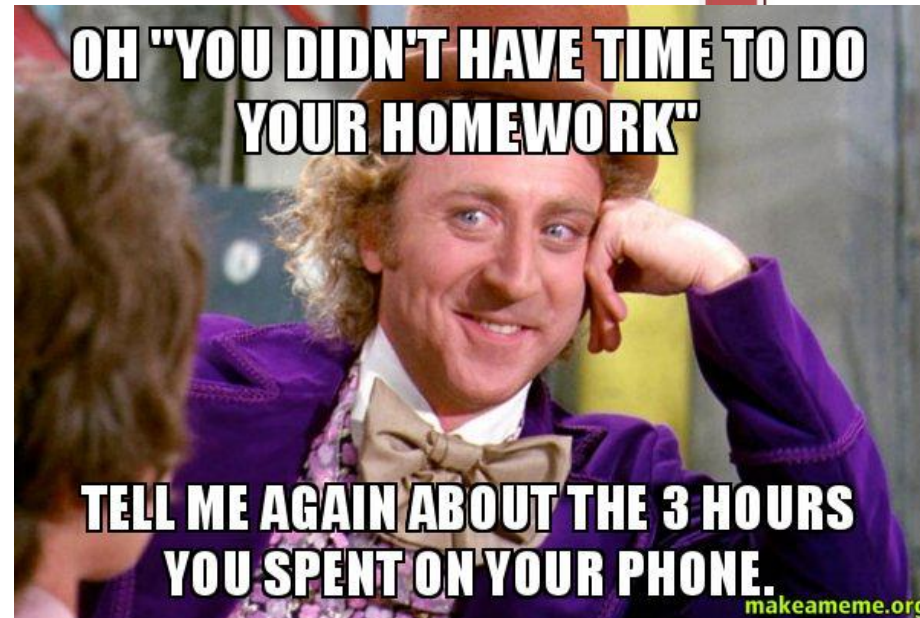
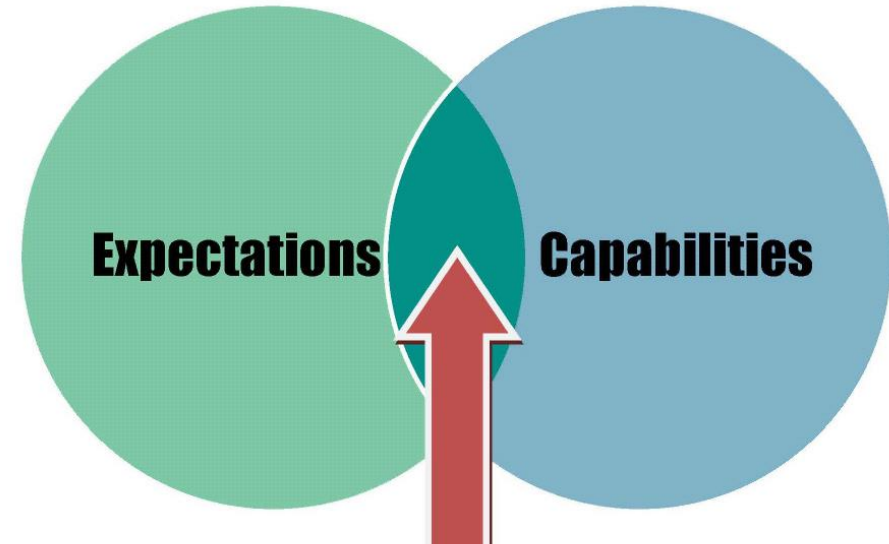
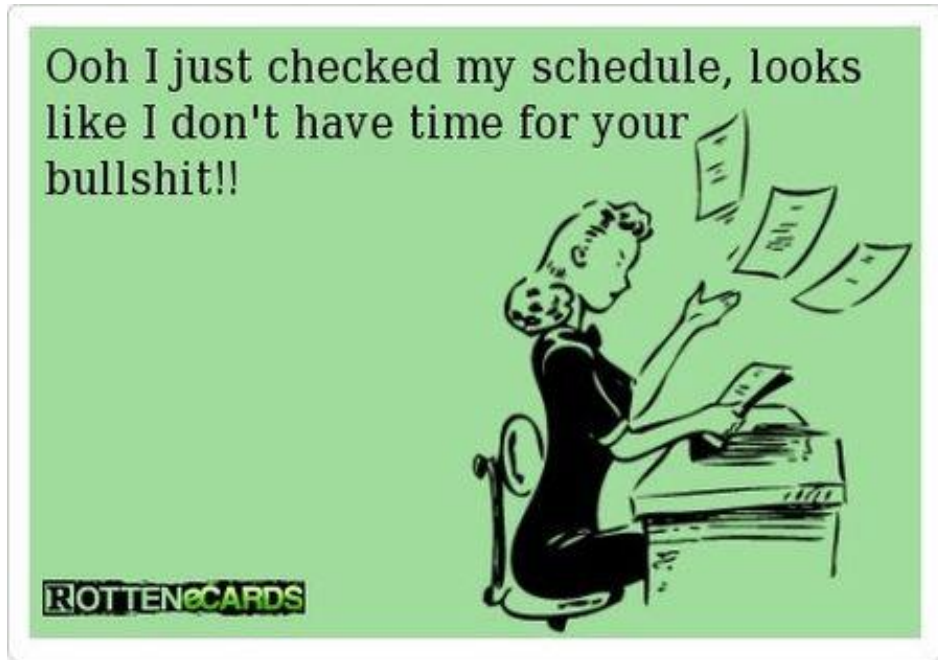
Resultados: preocupaciones – nivel profesor



<https://www.pinterest.com/pin/432486370448743887/>

<http://create-learning.com>

Resultados: preocupaciones – nivel profesor



www.create-learning.com

[Http://memegenerator.net](http://memegenerator.net)

<https://www.pinterest.com/pin/432486370448743887/>

<http://create-learning.com>

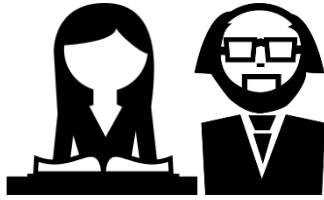
Methodology



Literature
- Policy
- Adoption



Students
- Survey
- Focus groups



Academic staff
- Survey
- Focus groups



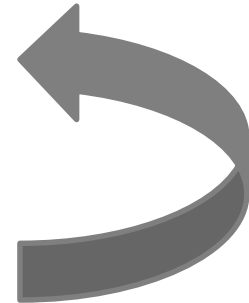
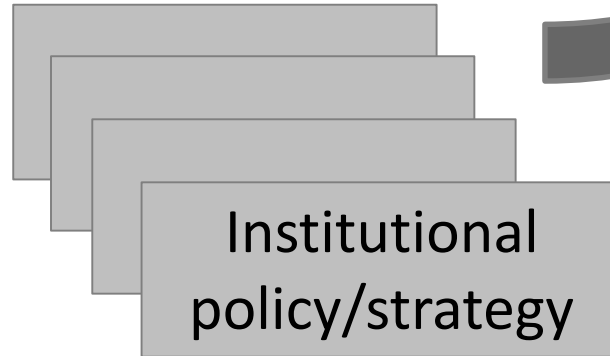
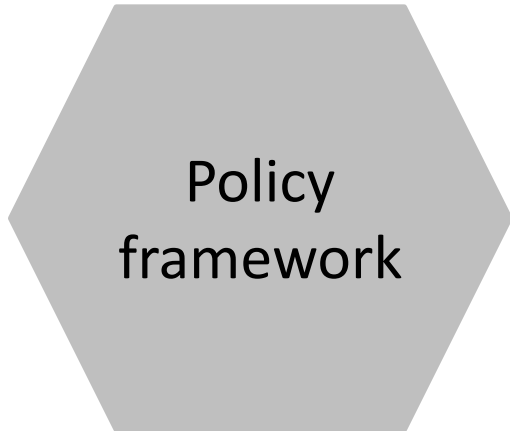
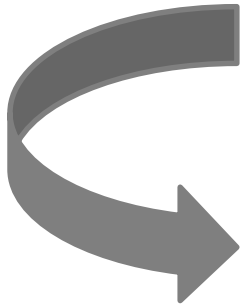
Senior managers
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Other stakeh.
- Workshops
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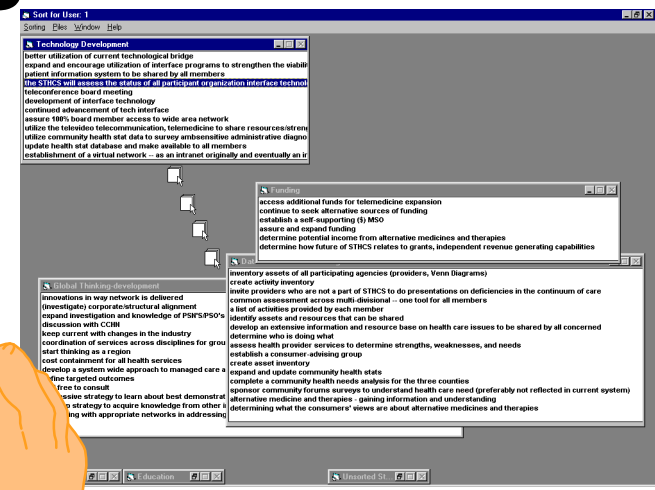
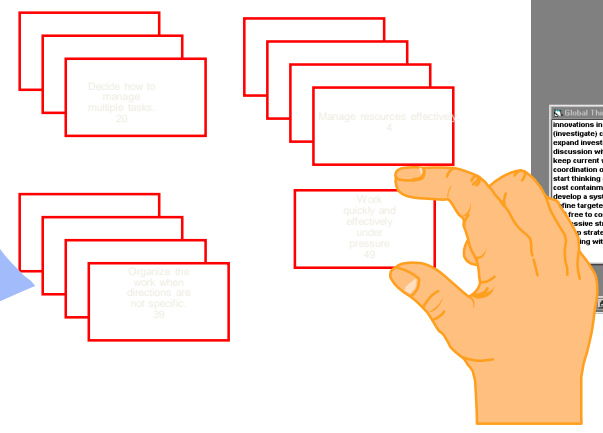


Estudio de mapeo de conceptos de grupo - expertos

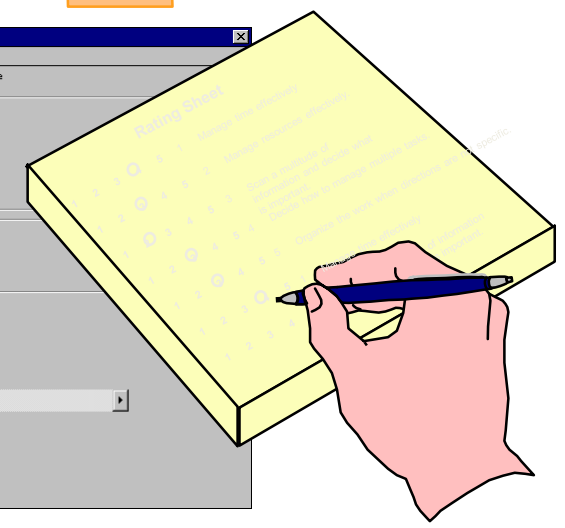
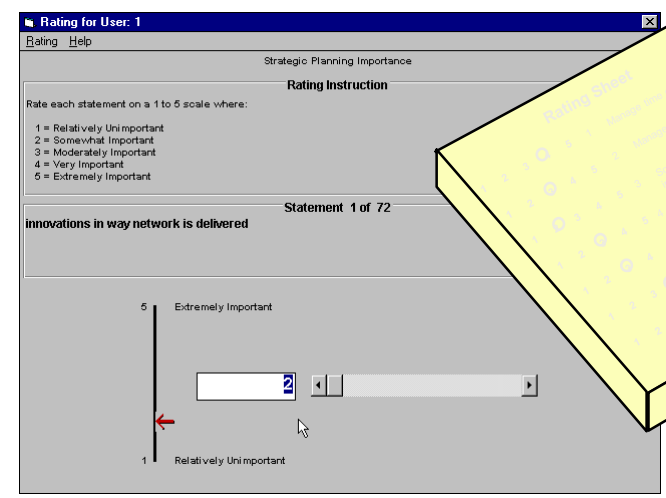
2. Ordenar

- innovations in way network is delivered
- (investigate) corporate/structural alignment
- assist in the development of non-traditional partnerships (Rehab with the Medicine Community)
- expand investigation and knowledge of PSNS/PSO's
- continue STHCS sponsored forums on public health issues (medicine managed care forum)
- inventory assets of all participating agencies (providers, Venn Diagrams)
- access additional funds for telemedicine expansion
- better utilization of current technological bridge
- continued support by STHCS to member facilities
- expand and encourage utilization of interface programs to strengthen the viability and to improve the health care delivery system (ie teleconference)
- discussion with CCHN

1. Brainstorm




...organizar los aspectos...



3. Evaluar



Learning Analytics


hide menu
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[Project Home](#)

[Brainstorming \(1\)](#)
status: OPEN [?](#)

[Sorting](#)
status: OPEN [?](#)

[Importance](#)
status: OPEN [?](#)

[feasibility](#)
status: OPEN [?](#)

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[Brainstorming Statements](#) [PREVIEW]

An important question that the SIG in Learning Analytics needs to address is how will learning Analytics affect the education in the Netherlands. Please generate as many statements as possible completing the following focus prompt: "One specific change that Learning Analytics will trigger in Dutch education is..." Please keep each statement brief, just one thought (e.g "Easy identifies students who are at risk of dropout...").

Please be as much concrete as possible. A statement that learning analytics improve learning is not going to work for the purpose of this study. If a similar (and too general) idea comes to your mind ask yourself how learning analytics improve learning, teaching, assessment to create more concrete ideas.

Select "add this statement" after each statement or idea. Your statement will then be saved and added to the list of collected statements at the bottom of the

Una característica esencial en una política institucional de analítica del aprendizaje debe ser ...

[Add This Statement](#)
Character Count: Maximum size is 250 characters

Search for statements:
[Search](#)
[Reset](#) [?](#)

that students will have much more direct and instant feedback on their progress and performance compared to now

Brainstorming Completed

Done with Preview

Group Concept Mapping

Ordenación online



sign out

Instructions Create a pile Save Arrange all Minimize all Maximize all Edit pile name Switch to

assignments/courses/projects.

New innovations will be more tested and evidence-based.

Can deliver fine-grain (daily) feedback of group and individual behaviour.

Excellent students can be identified and rewarded.

School leaders can have more insight into the performance of their teachers.

Will make class management easier

Provides affordance to increase student motivation.

Content and context will be better adapted to the needs and challenges of each individual student.

Improve educational research by providing a method for investigating effects of instructions on learning outcomes and transfer.

Can achieve more personalized education, challenging students at

Teachers

Teacher courses about learning analytics.

More sophisticated teaching methods.

Enables teachers to track students' progress.

Personalisation

Students will have much more direct and instant feedback on their progress and performance compared to now.

Risks

Privacy issues in education will come more to the fore.

Teachers Personalisation Risks

Group Concept Mapping

Evaluación online



Progress:

Project Home

Participant Questions

status: *COMPLETED* ?

Sorting

status: *STARTED* ?

Rating: Importance

status: *STARTED* ?

Rating: Feasibility

status: *OPEN* ?

My Account

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Importance Rating

Please rate the following statements, in the range indicated below.

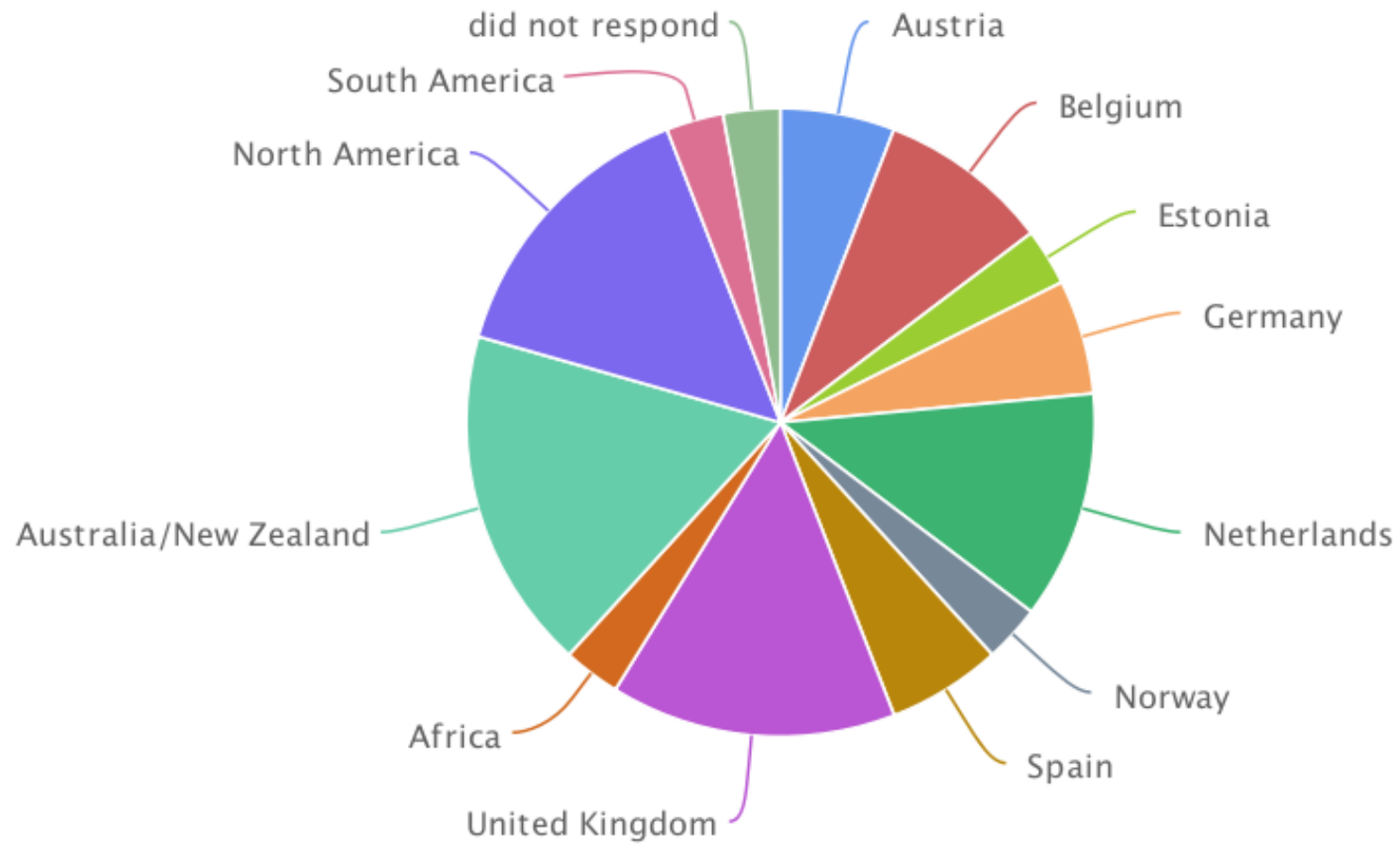
Rate each statement on a 1-to-5 scale where: 1=relatively unimportant; 2=somewhat important; 3=moderately important; 4=very important; 5=extremely important. Try to use the full range of ratings values (e.g. 1 to 5). In absolute sense, maybe every statement is important but your task here is to judge the relative importance of the statements when compared to each other.

Project Focus Prompt: One specific characteristic of effective handover training is...

Show unrated statements only Show all statements

Rating		Statement
<i>relatively unimportant</i>	<i>extremely important</i>	
<input type="radio"/> 1	<input checked="" type="radio"/> 4	Look for a standard approach to handover communication. [unrate]
<input type="radio"/> 2	<input type="radio"/> 5	
<input type="radio"/> 3		Adopt methods already used in other domains (Crew Resource Management, I-SBAR, Five Ps, I-PASS-THE-BATTON). [unrate]
<input type="radio"/> 4		Shift attention from one doctor-one patient relationships to cross-cover patient commitments and transfer of professional responsibility. [unrate]
<input type="radio"/> 5		Adopt methods of high-performance teams. [unrate]
<input type="radio"/> 1		Create appropriate attitudes, climate and role models.
<input type="radio"/> 2		Teach handover providers to tell a 'better story'.
<input type="radio"/> 3		
<input type="radio"/> 4		
<input type="radio"/> 5		

Expertos participantes





Mapa de puntos

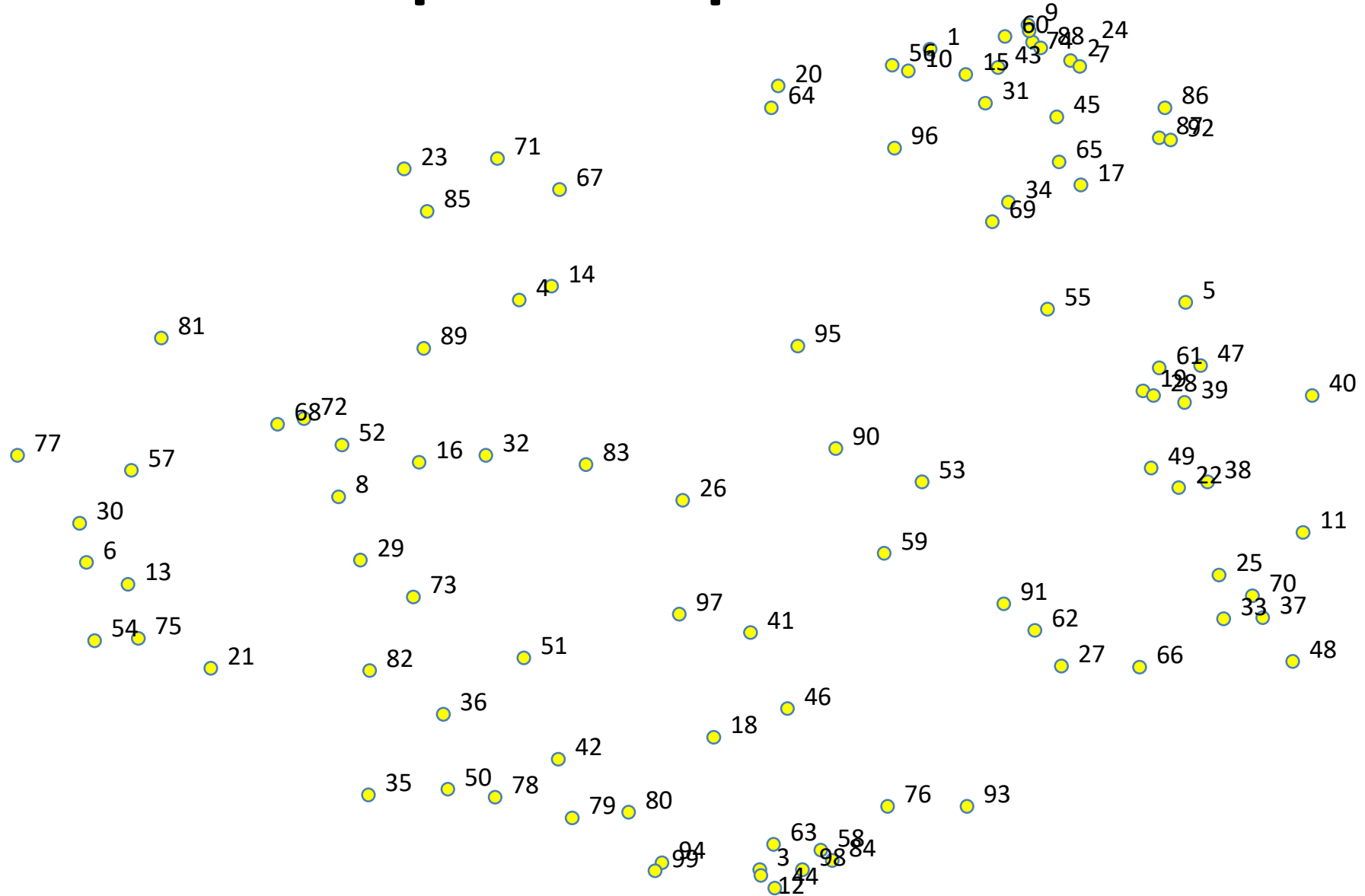
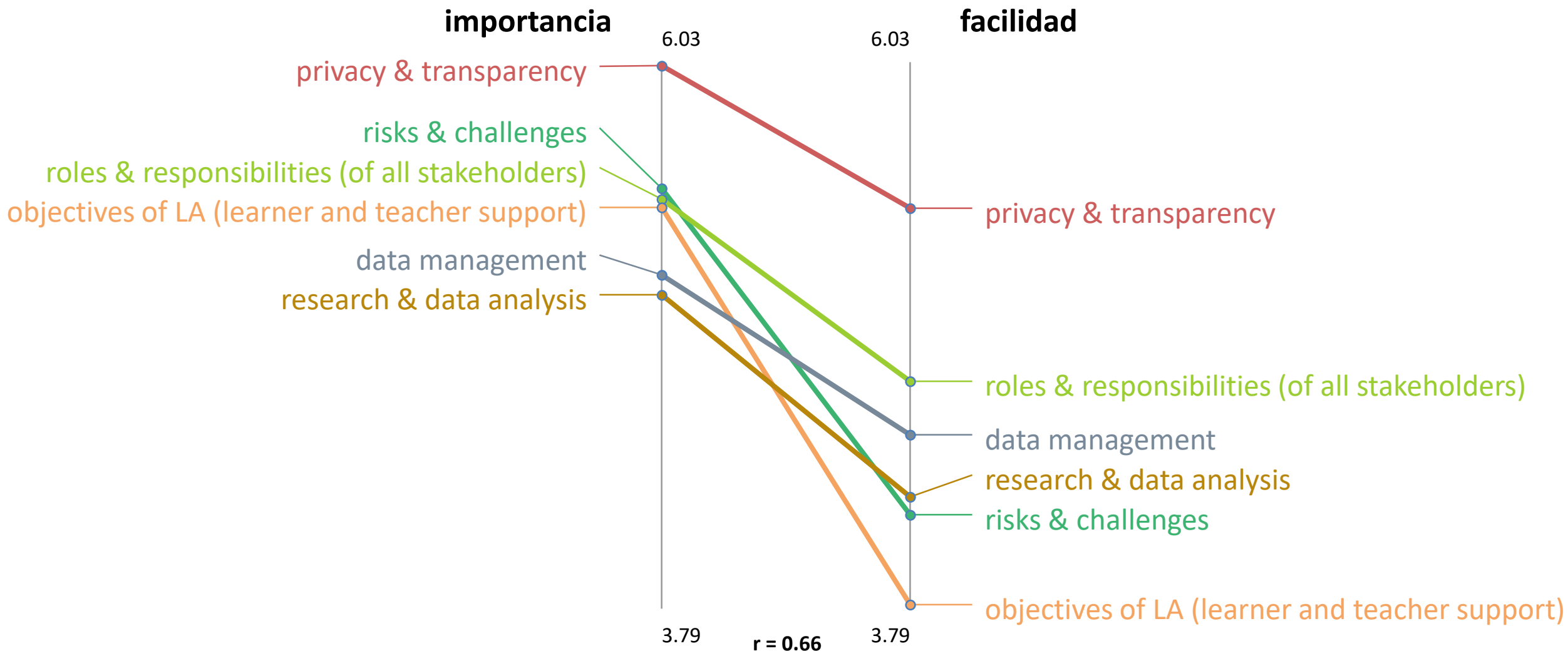




Gráfico de evaluación



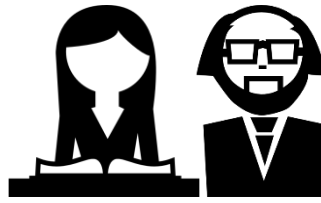
Methodology



Literature
- Policy
- Adoption



Students
- Survey
- Focus groups



Academic staff
- Survey
- Focus groups



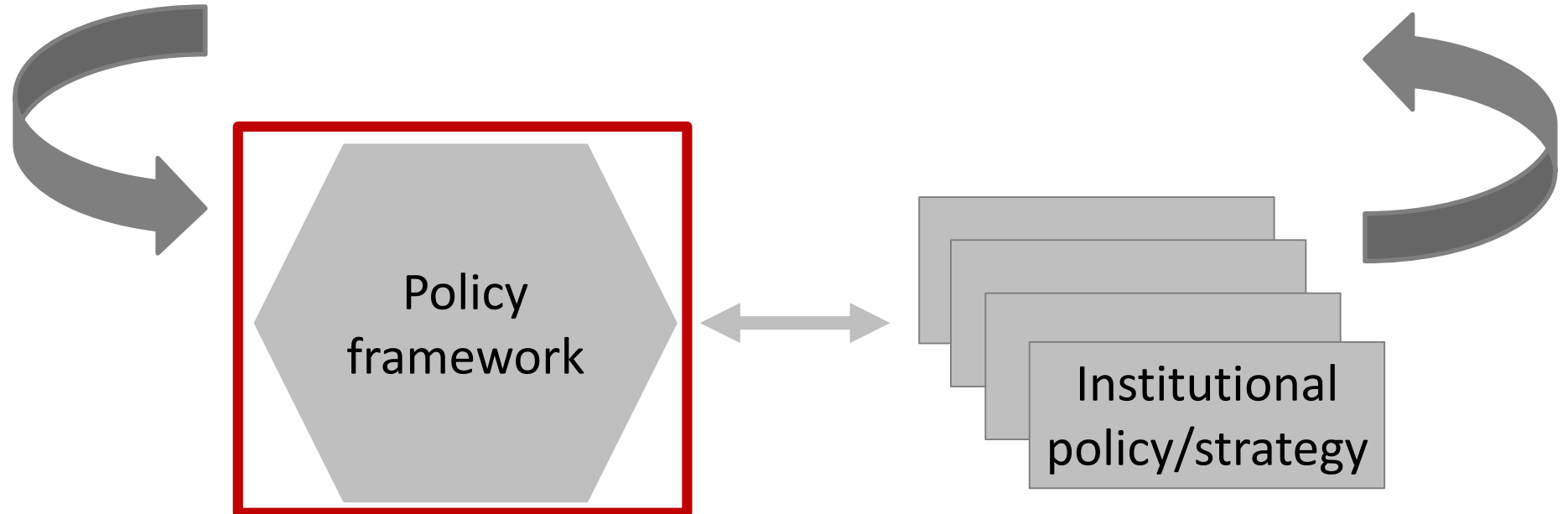
Senior managers
- Survey
- Interviews

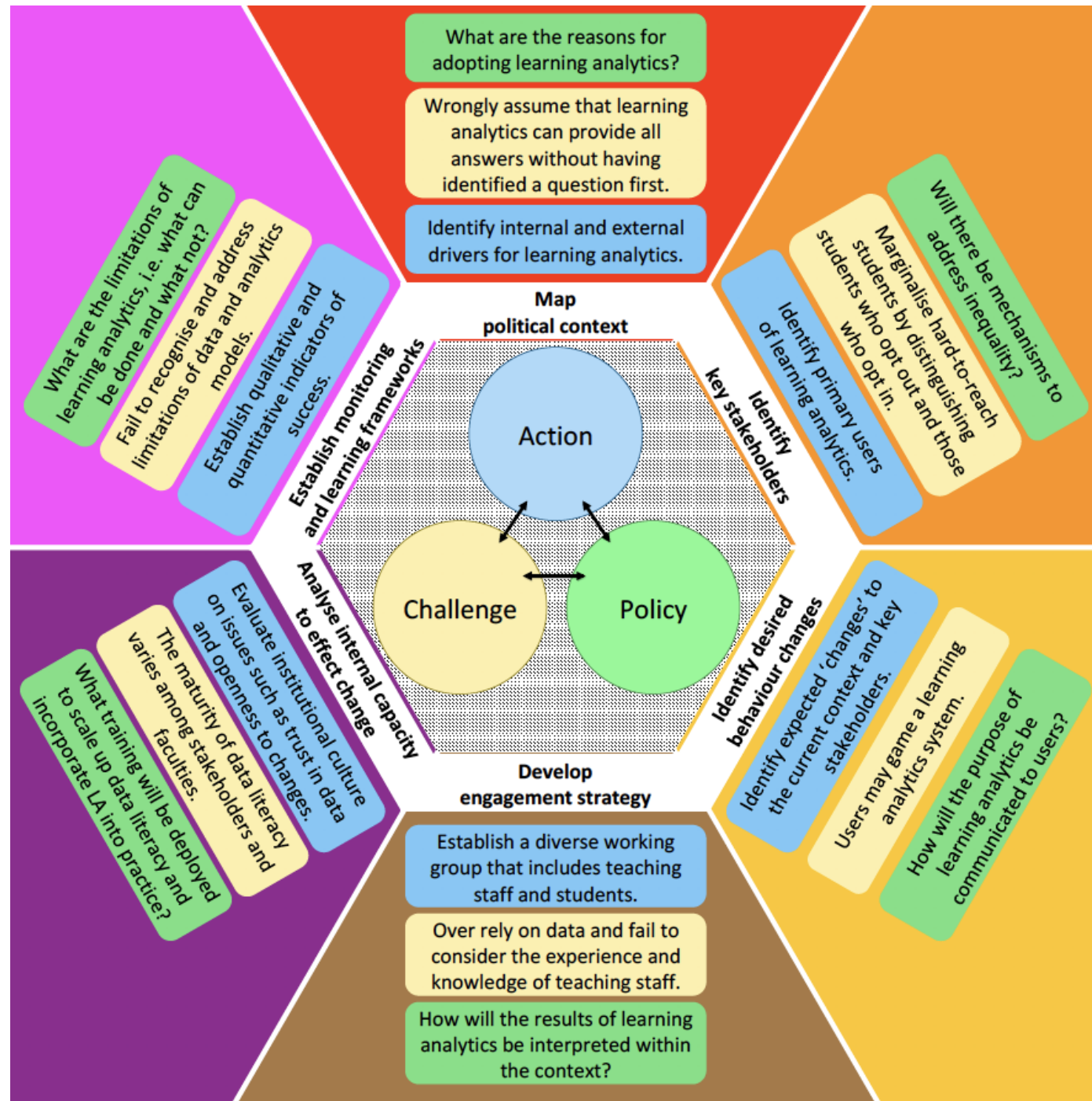


Experts
- Group concept mapping



Other stakeh.
- Workshops
- Committees





SHEILA policy framework

STEP 2 – Identify key stakeholders		
ACTION	CHALLENGES	POLICY
<ul style="list-style-type: none"> Identify primary users of learning analytics (e.g., students, lecturers/tutors, and senior managers). Identify senior management team to gain support (e.g., vice-chancellor/ principal/ provost). Identify professional teams (e.g., IT, legal team, strategy team, Student Support, Registry, library). Identify academic teams (e.g. Learning & Teaching committee, Digital Learning, research project teams) Identify external partners (e.g., researchers, and service providers) Identify internal champions of learning analytics (bottom-up approach). 	<p><i>Ethics</i></p> <ul style="list-style-type: none"> Marginalise hard-to-reach students by drawing a distinction between students who opt out and those who opt into a learning analytics service. The choice of opt-out could affect those who choose to opt in regarding the quality of data and services provided. <p><i>Management</i></p> <ul style="list-style-type: none"> Define ownership and responsibilities among professional groups within the university <p><i>Privacy</i></p> <ul style="list-style-type: none"> Sharing data with third parties requires a careful check of security issues and breaches of privacy. 	<p><i>Data management</i></p> <ul style="list-style-type: none"> How will consent be obtained? Is there an option to opt-out of any data collection and analysis? Who can access the data? Who owns the data? Will data be included in personally-identifiable formats? <p><i>Methodology</i></p> <ul style="list-style-type: none"> Whose data will be collected? <p><i>Stakeholder engagement</i></p> <ul style="list-style-type: none"> Who is the policy for? Whose working activities will the policy shape? How will responsibilities be defined for each stakeholder?

Methodology



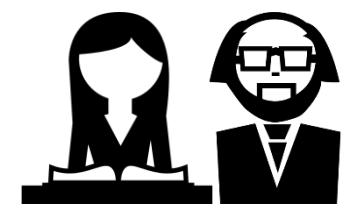
Literature

- Policy
- Adoption



Students

- Survey
- Focus groups



Academic staff

- Survey
- Focus groups



Senior managers

- Survey
- Interviews



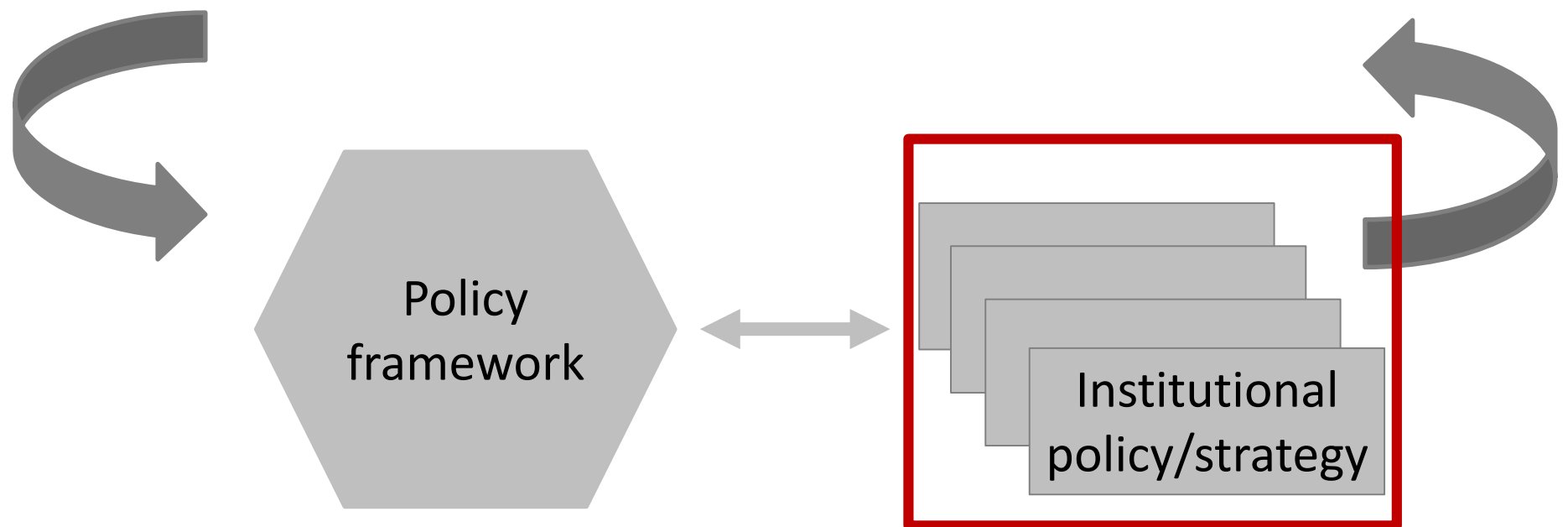
Experts

- Group concept mapping



Other stakeh.

- Workshops
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LALA project: Learning Analytics in Latin American

<https://lalaproject.org/>



Socios del Proyecto LALA

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- Partners

- Universidad Carlos III de Madrid (UC3M)
- Katholieke Universiteit Leuven (KUL)
- University of Edinburgh (UE)
- Escuela Superior Politécnica del Litoral (ESPOL)
- Universidad de Cuenca (UC)
- Pontificia Universidad Católica de Chile (PUC)
- Universidad Austral de Chile (UACh)



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Universidad Austral de Chile
Conocimiento y Naturaleza

- Dotar de capacidades a diferentes instituciones en Latinoamérica para crear, adaptar, implementar y adoptar herramientas de analítica del aprendizaje para mejorar los procesos de decision académica
- Como una consecuencia, mejorar la calidad, eficiencia y relevancia de la educación en Latino América mediante el uso de la analítica del aprendizaje

Objetivos específicos (I)



- Crear un entorno LALA que describa diferentes aspectos para la adopción de analítica del aprendizaje en Latino América. Se tomará como base SHEILA
 - Encuestas y focus groups con alumnos y profesores en instituciones de Latinoamérica
 - Entrevistas con gestores de las universidades
 - Diferencias con entorno europeo

- Adaptación de herramientas de analítica de aprendizaje y realización de pilotos
 - Paneles de visualización
 - Predicción temprana por ejemplo de dropouts



Objetivos específicos (III)



- Creación de una comunidad LALA de analítica de aprendizaje en Latinoamérica
 - I Summer School y conferencia de analítica de aprendizaje en Latino América
 - Más de 20 partners asociados en la actualidad

- Cuatro fundamentales
 - Profesores (> 300 en pilotos, >120 dando formación)
 - Alumnos (> 5.000 en pilotos, evidencia de mejora en los procesos de aprendizaje)
 - Gestores que toman decisiones
 - Proveedores académicos de ICT

Conclusiones

- Los datos en educación tienen un gran potencial y pueden mejorar el proceso educativo
- Es un área reciente de investigación donde ha habido muchos avances
- A nivel institucional la adopción es baja en Europa y Latino América
- Existen diferentes barreras para su adopción que hay que resolver, hemos visto perspectivas de alumnos, profesores, expertos, gestores, etc.



<http://sheilaproject.eu/>



crue

Universidades
Españolas

TIC



<https://lalaproject.org/>

Hacia la adopción de analítica de aprendizaje en instituciones de educación superior en Europa y Latino América

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