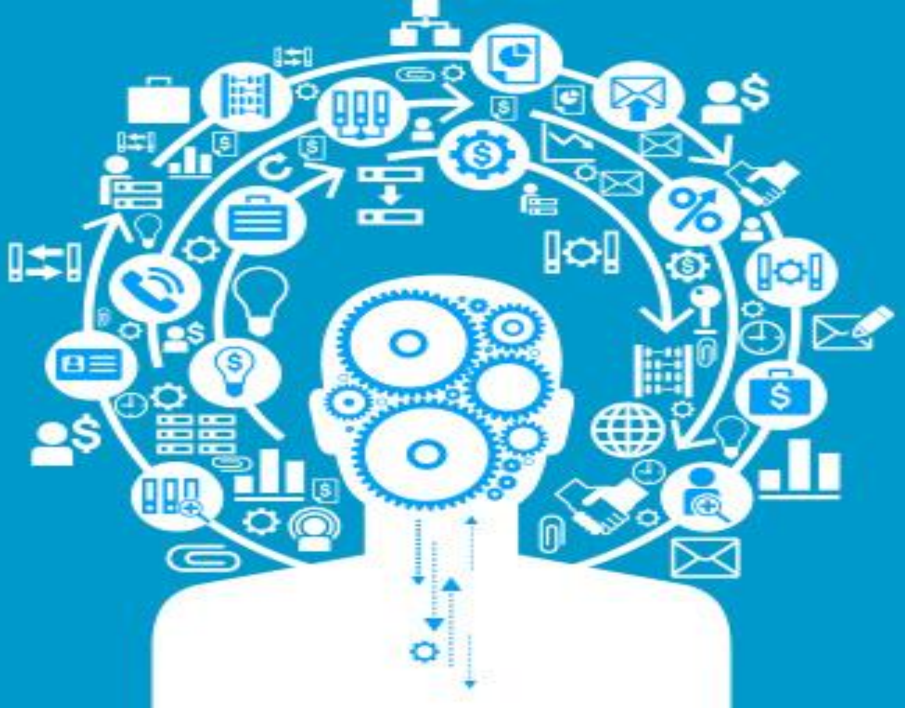
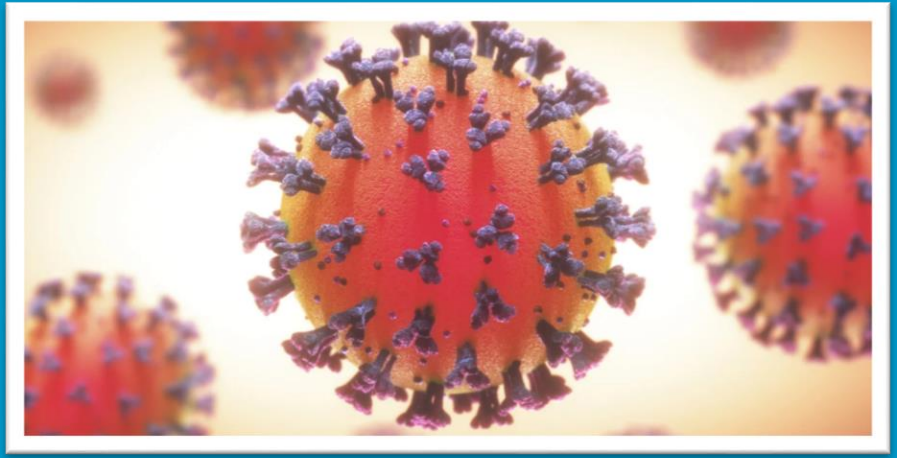




… in COVID's time

Addressing complex real-world challenges in software engineering education through the integration of gamification and crowdsourcing

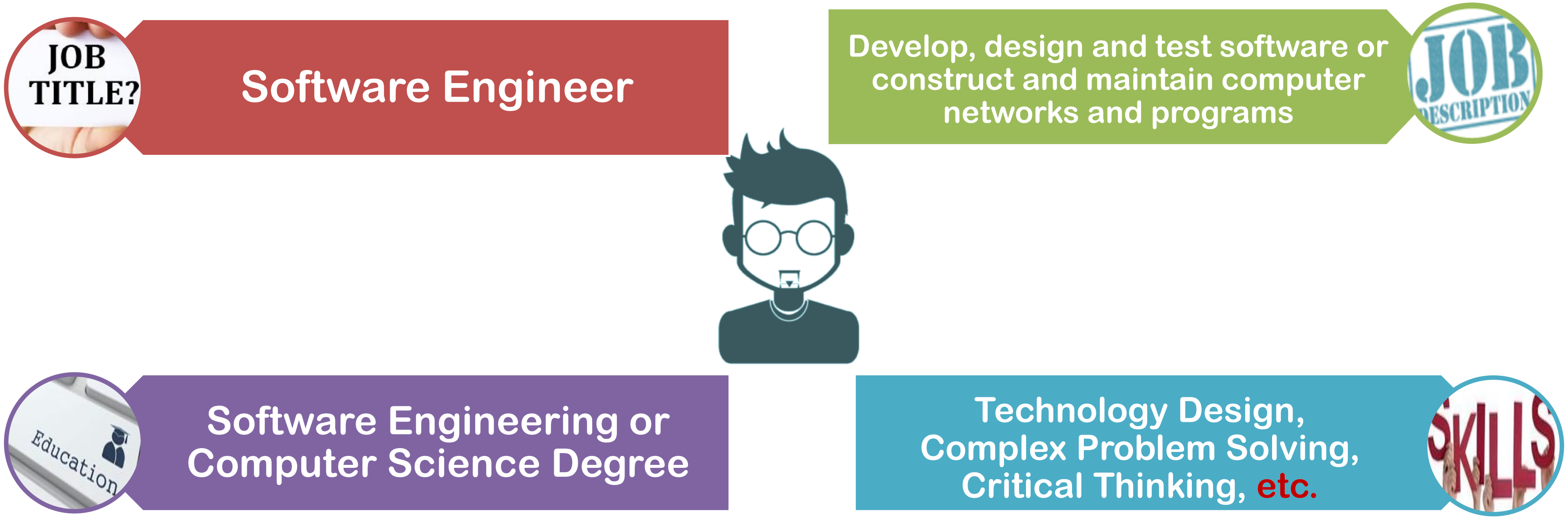
Mercedes Ruiz, Manuel Trinidad & Alejandro Calderón

University of Cádiz

Second International Conference "Scuola Democratica" – Reinventing Education 2-5 June 2021

Addressing complex real-world challenges in software engineering education through the integration of gamification and crowdsourcing

Addressing complex real-world challenges in software engineering education through the integration of gamification and crowdsourcing


JOB TITLE?
JOB DESCRIPTION
Education
SKILLS

Software Engineer

Develop, design and test software or construct and maintain computer networks and programs

Software Engineering or Computer Science Degree

Technology Design, Complex Problem Solving, Critical Thinking, etc.

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software engineering education

Design Communication

Software engineers should be able to:

Communication Learning Outcomes from Software Engineering Professionals: A Basis for Teaching Communication in the Engineering Curriculum
Susan Ruff and Michael Carter. 39th ASEE/IEEE Frontiers in Education Conference, 2009

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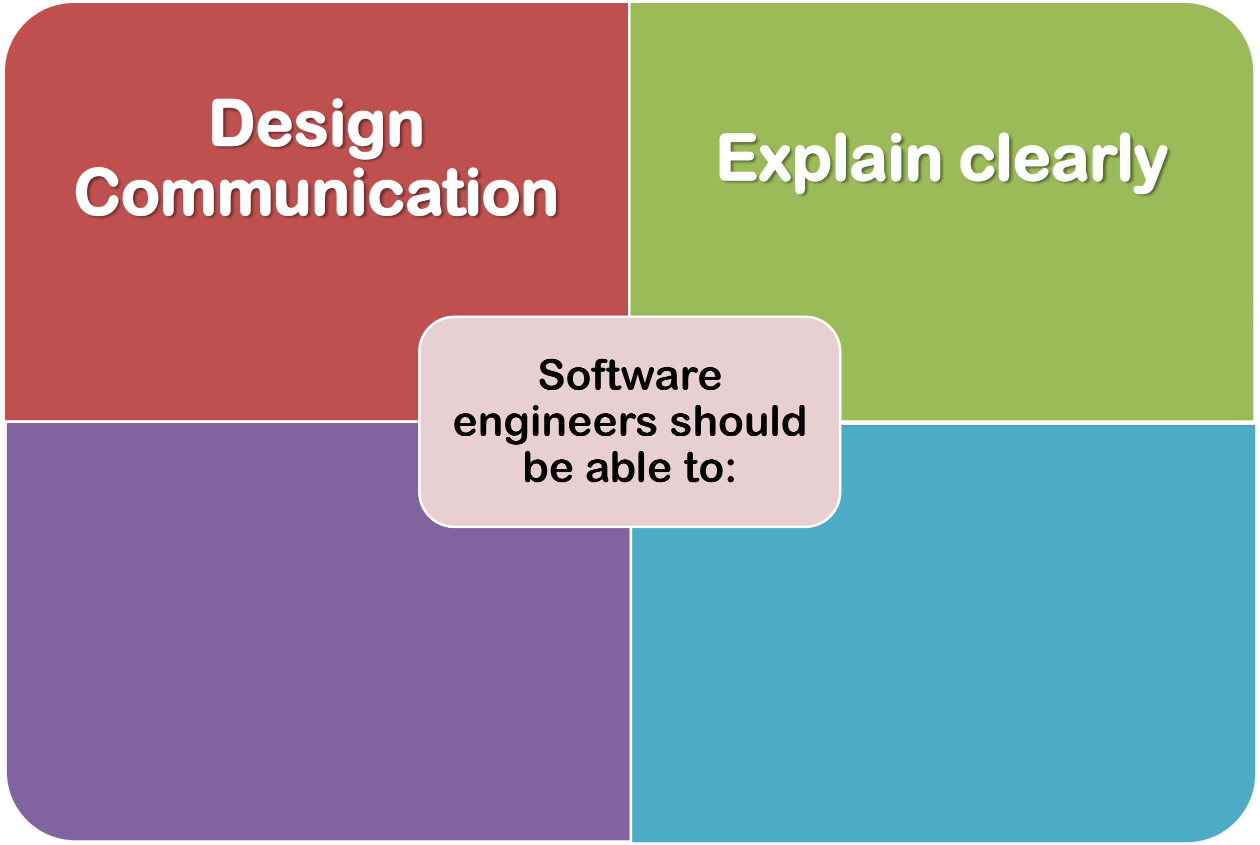
software engineering education



Design Communication

Explain clearly

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software engineering education

Design Communication

Explain clearly

Software engineers should be able to:

Discuss productively

Robert
Janet
Samuel
Tony
Maggie

Communication Learning Outcomes from Software Engineering Professionals: A Basis for Teaching Communication in the Engineering Curriculum
Susan Ruff and Michael Carter. 39th ASEE/IEEE Frontiers in Education Conference, 2009

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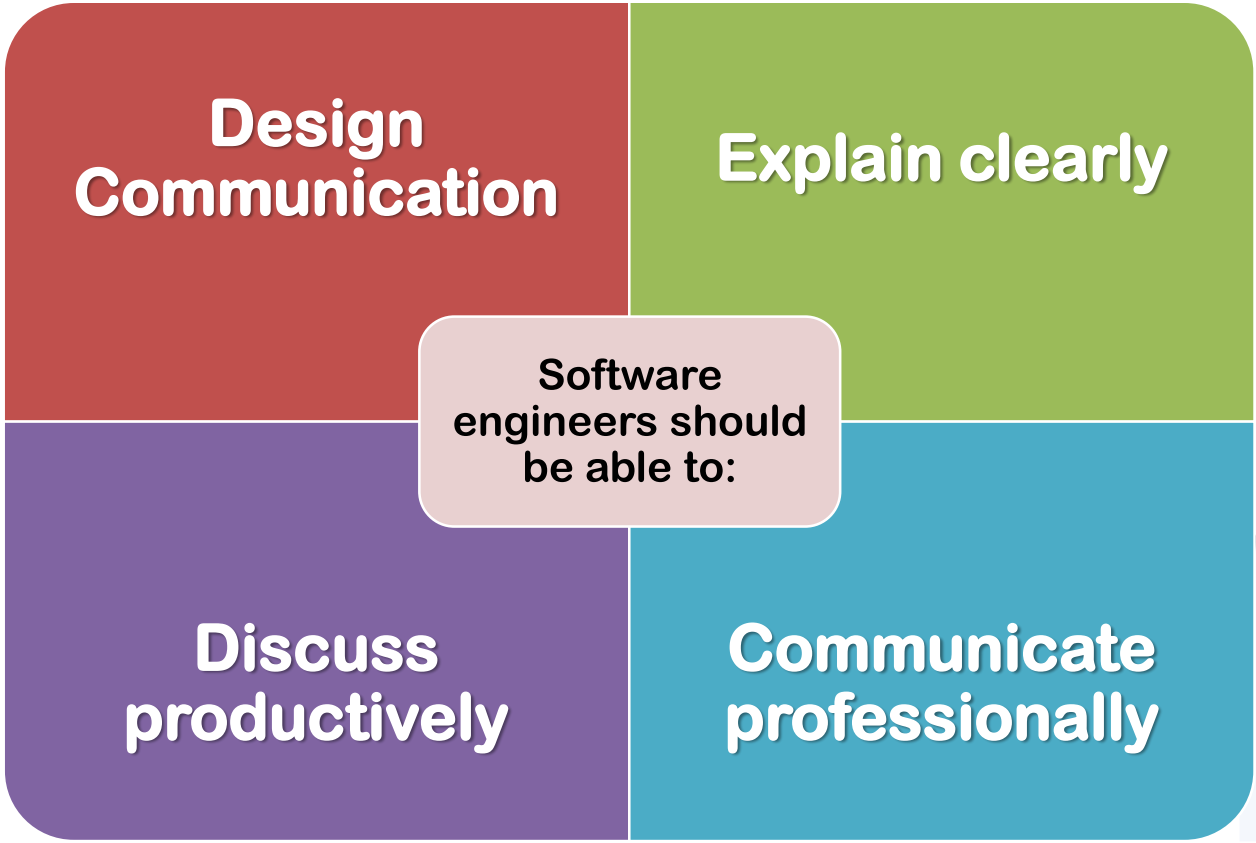

Software engineers should be able to:

Design Communication

Explain clearly

Discuss productively

Communicate professionally

Communication Learning Outcomes from Software Engineering Professionals: A Basis for Teaching Communication in the Engineering Curriculum
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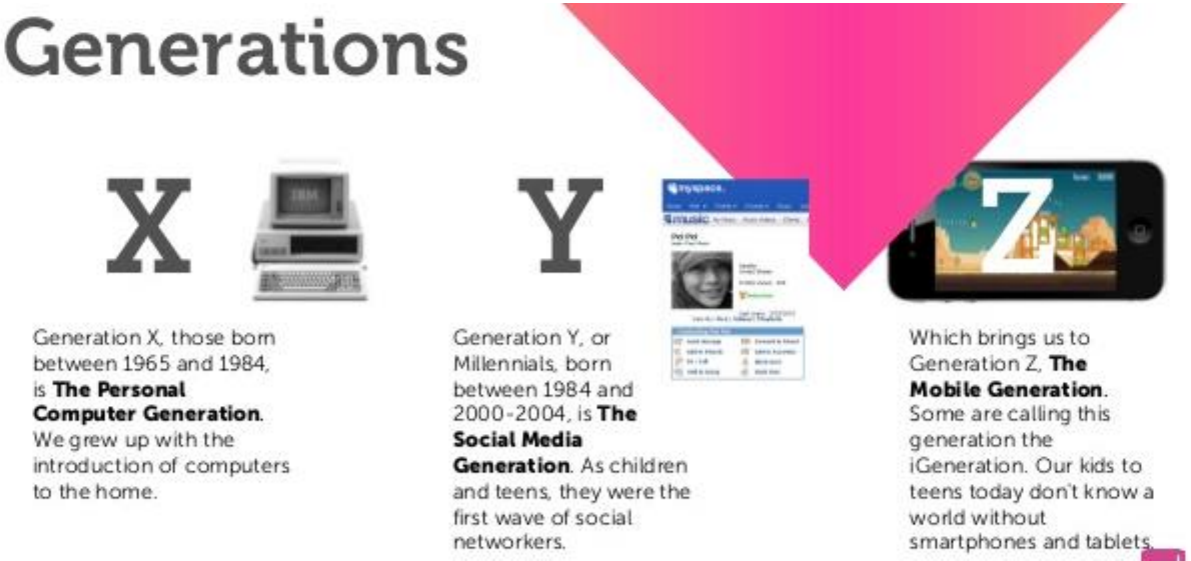

Generations

X

Generation X, those born between 1965 and 1984, is **The Personal Computer Generation**. We grew up with the introduction of computers to the home.

Y

Generation Y, or Millennials, born between 1984 and 2000-2004, is **The Social Media Generation**. As children and teens, they were the first wave of social networkers.

Z

Which brings us to Generation Z, **The Mobile Generation**. Some are calling this generation the iGeneration. Our kids to teens today don't know a world without smartphones and tablets.

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Obama's New Boss
Syria face-off McCain vs. Brzezinski
PLUS: Summer's best movies & more
TIME
THE
ME ME ME
GENERATION
Millennials are lazy, entitled narcissists who still live with their parents
Why they'll save us all
BY JOEL STEIN

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Lecture

Multimedia

Group work

Research based methods

Obama's New Boss
McCain vs. Brzezinski

TIME

THE ME ME ME GENERATION

Millennials are lazy, entitled narcissists who still live with their parents

Why they'll save us all

BY JOEL STEIN

Information

Application

Connection with reality

Relevance

Rigid/formal

Informal interaction

Relaxed

Rapport

Very relational

Connection on a personal level

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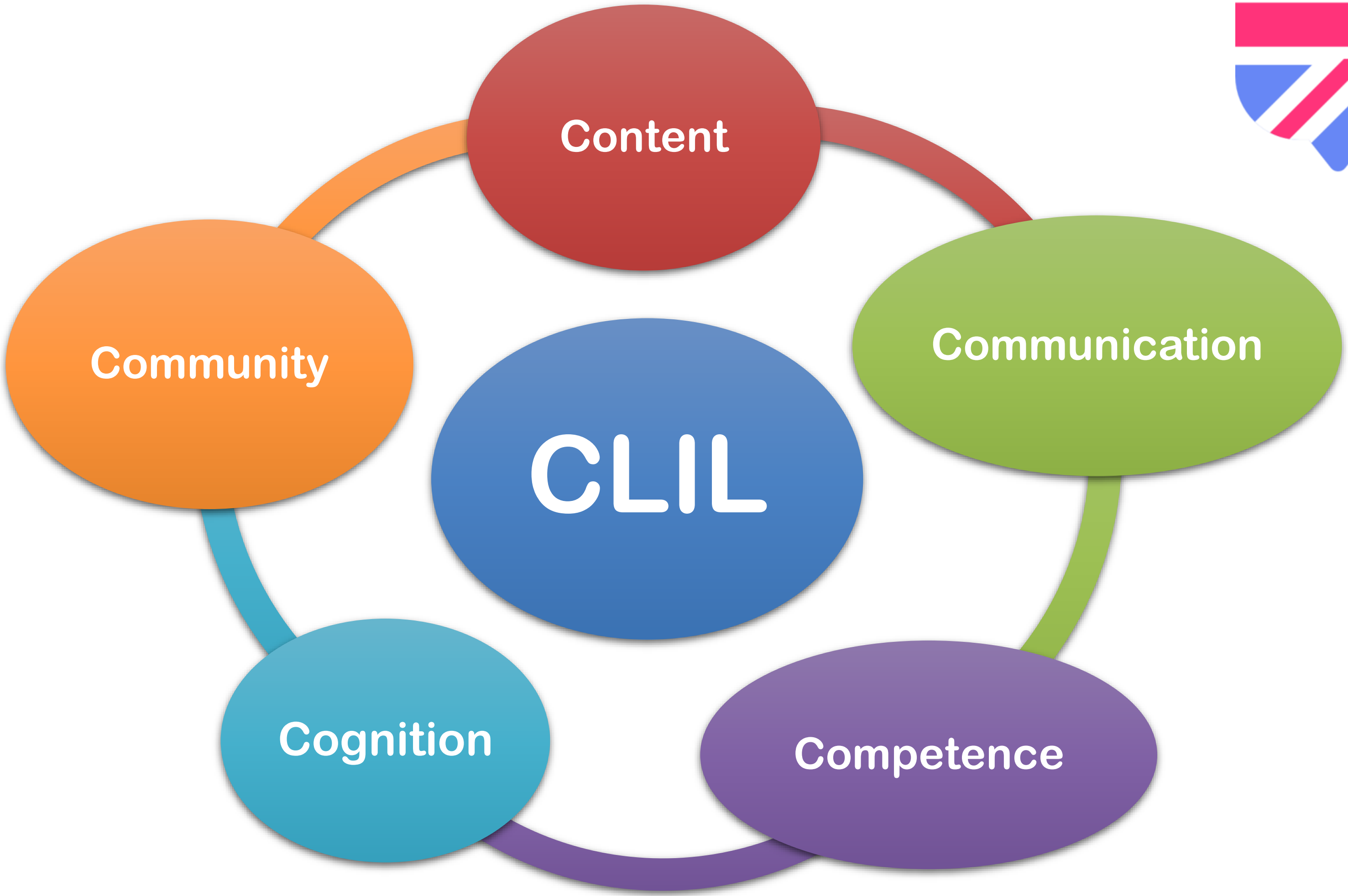

CLIL

Content

Communication

Competence

Cognition

Community

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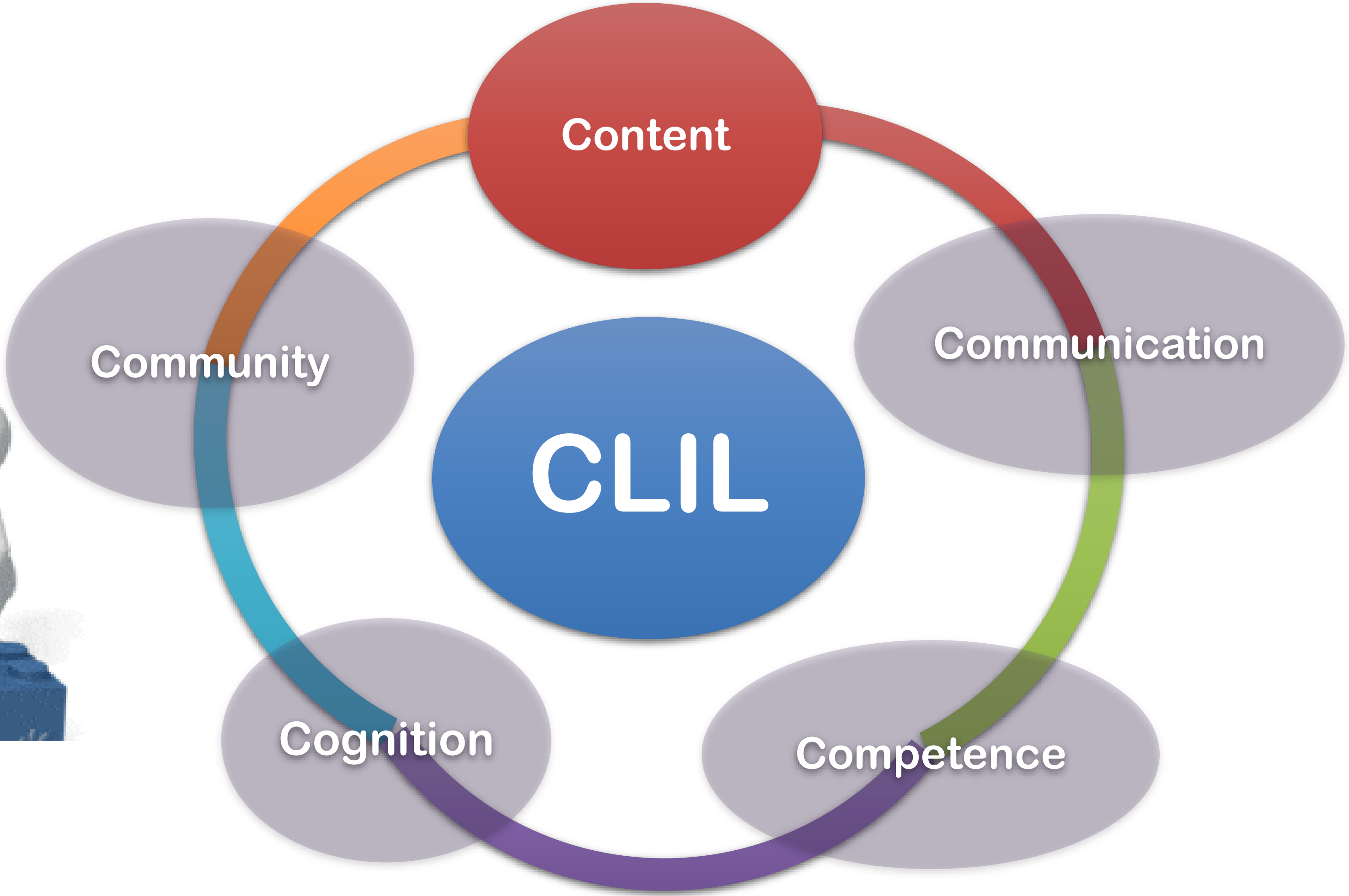
complex real-world challenges



Content

Communication

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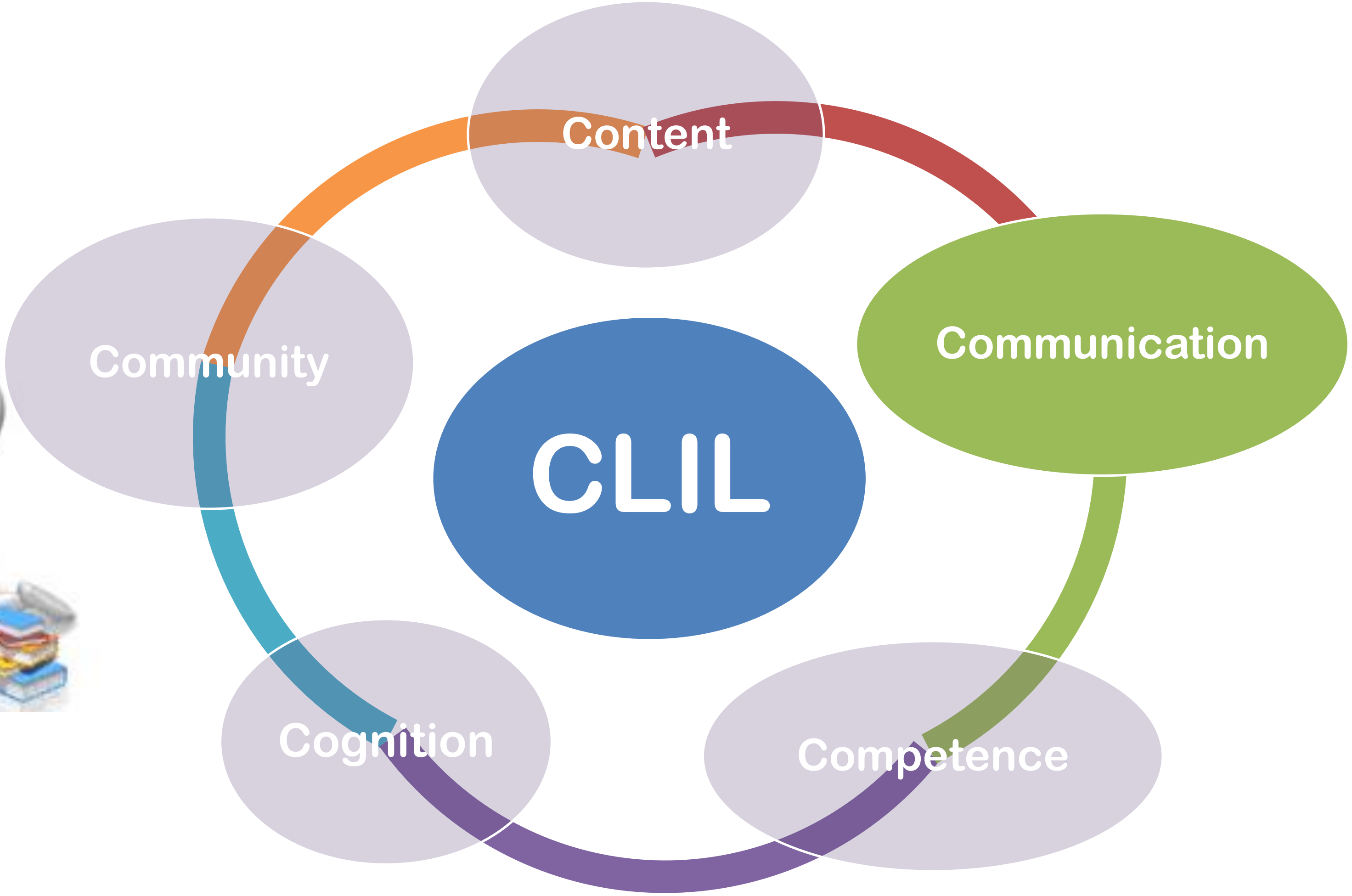
complex real-world challenges



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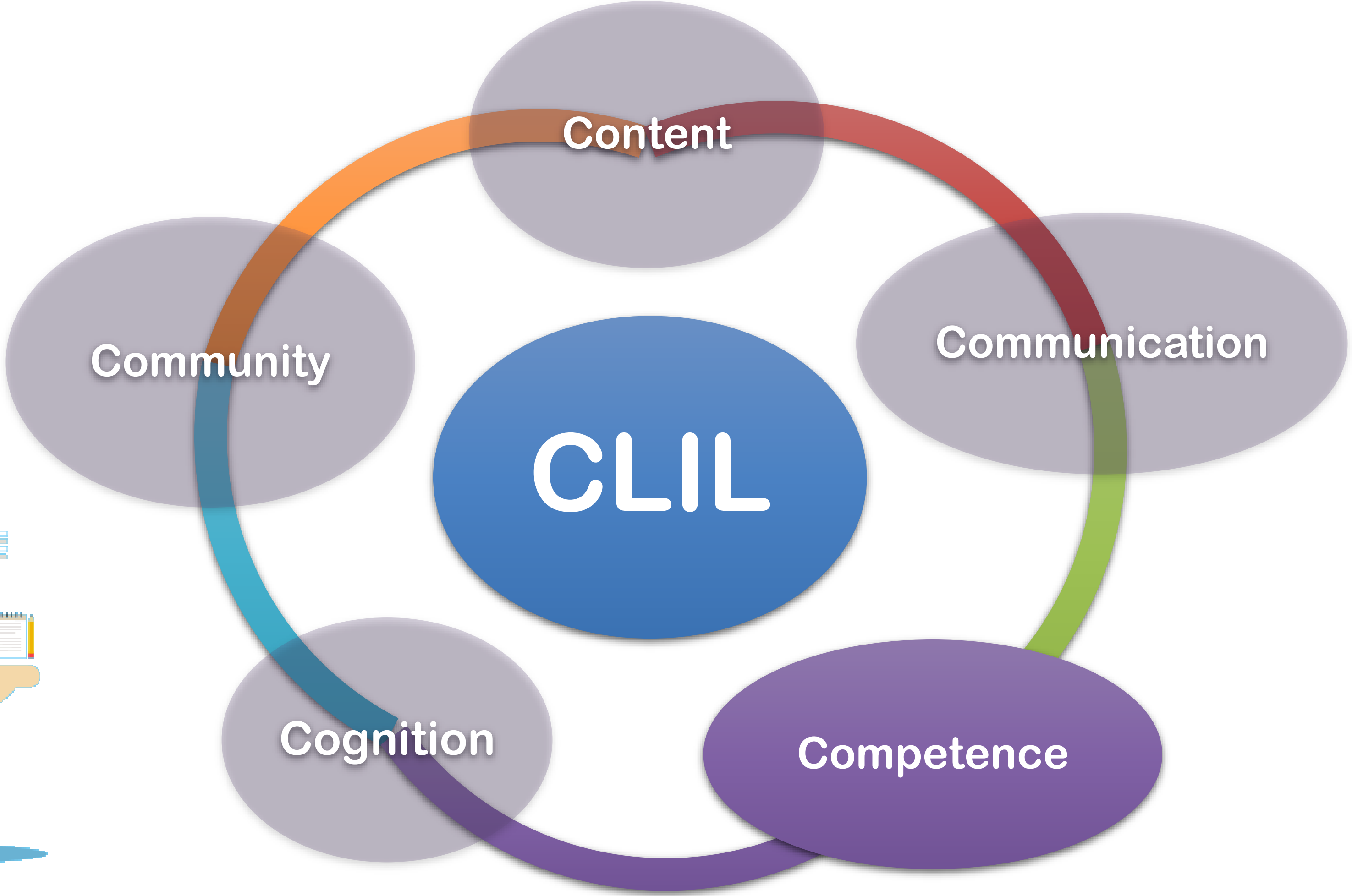

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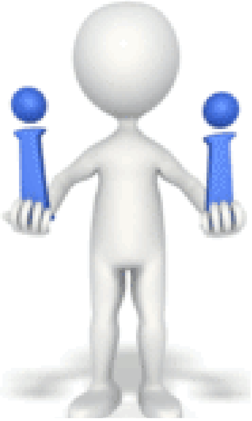
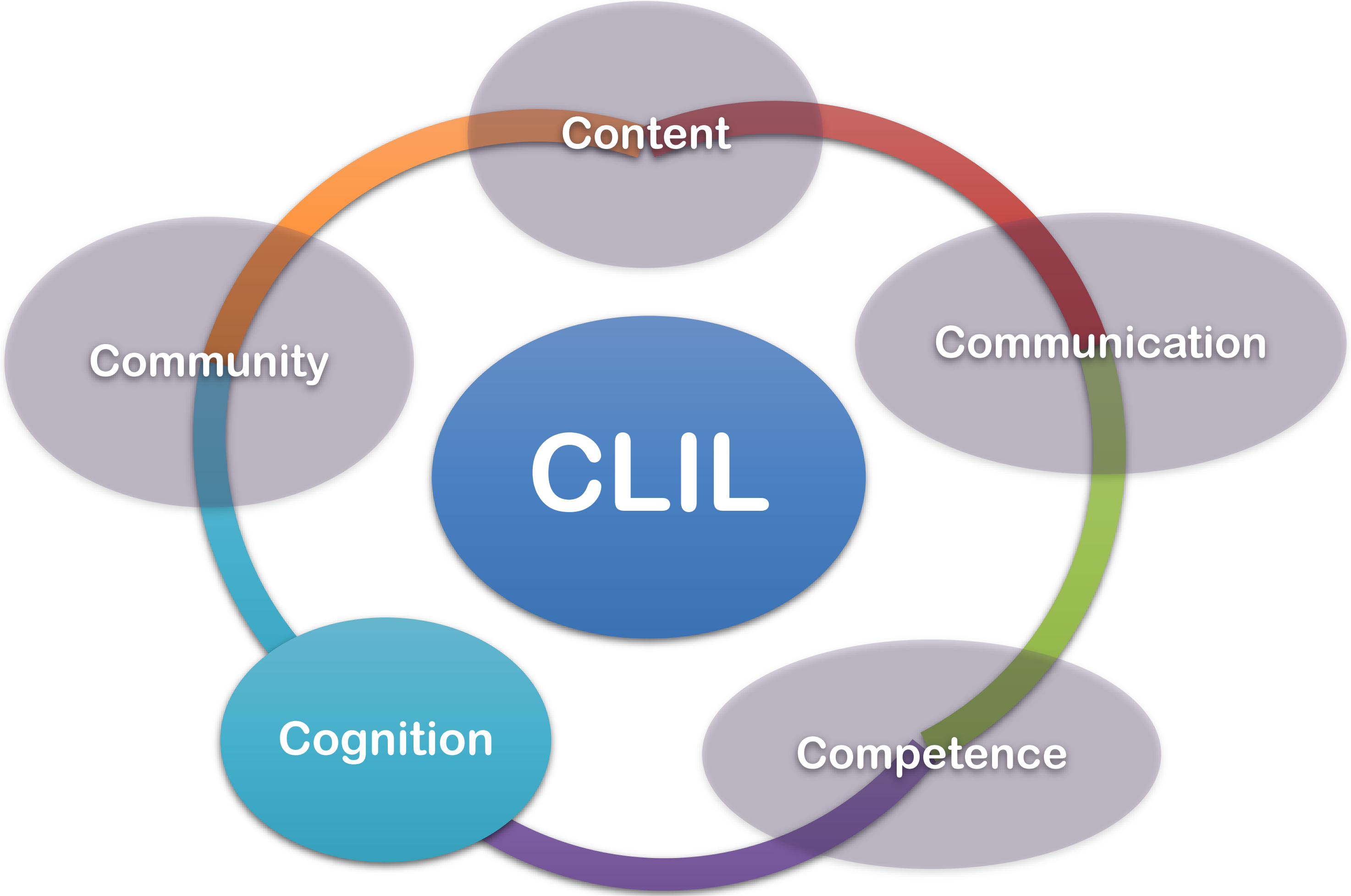
complex real-world challenges





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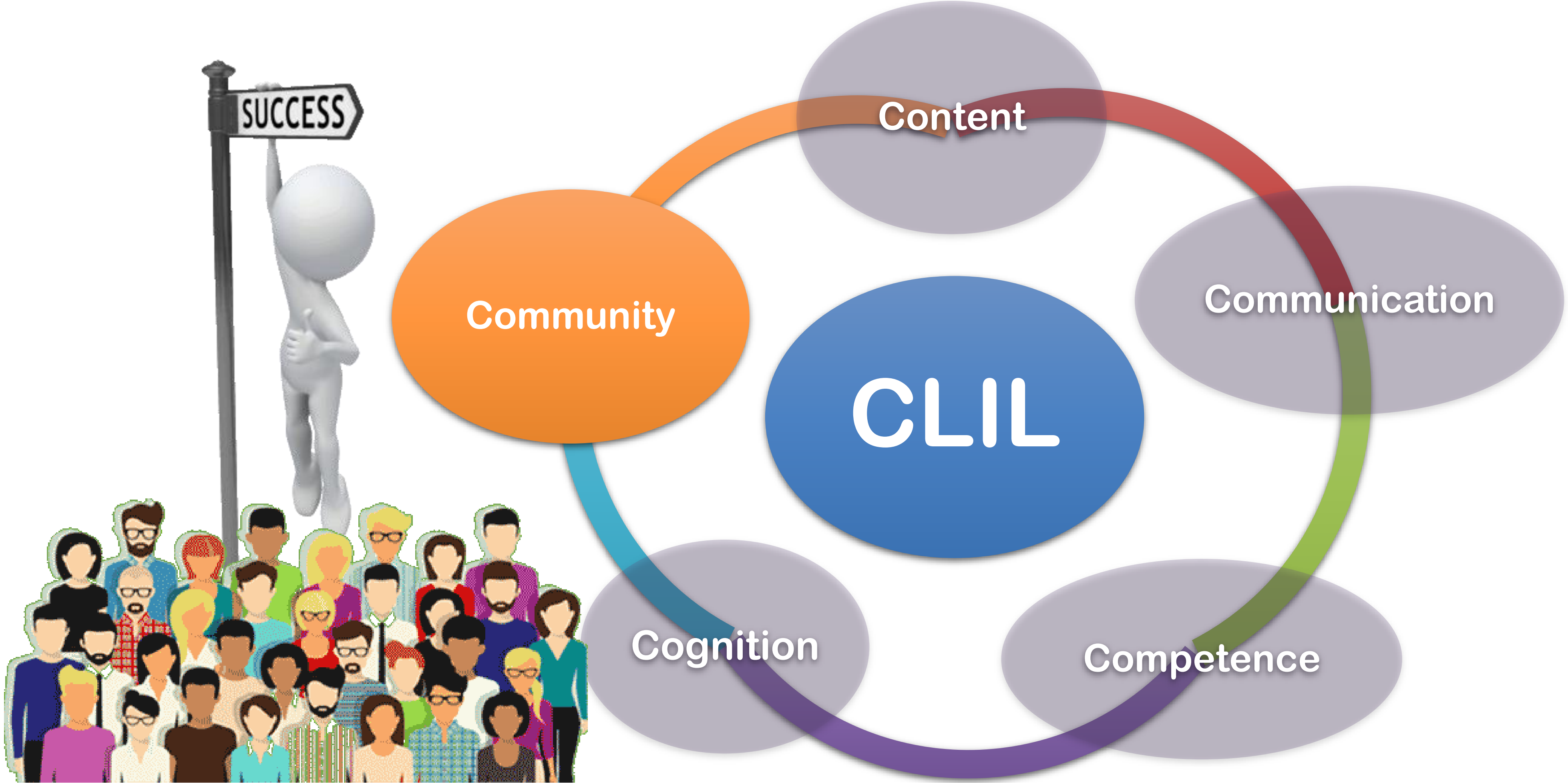
complex real-world challenges



CLIL

Content

Communication

Competence

Cognition

Community

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THE FUTURE WORKPLACE

Digital Natives

- Born during or after the digital age
- Always on, attached to a phone or other device
- Intuitive learners
- Multitask and rapidly task-switch
- Extremely social
- Multimedia oriented

"Serious games are
MORE THAN
FUN."

PLAY
TO LEARN:

PEOPLE ARE ASKING
"WHY CAN'T THIS BE FUN"
I WANT TO PLAY
WHERE'S THE FUN?
FUN NOW!

Associate Feedback	Results
85.6% Stated that gamification increased their participation in learning	**22.9%** Reduction in incidents
86.6% Increase in confidence	**$2.2 Mil.** Annual Savings

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"Large groups of people are smarter than an elite few, no matter how brilliant–better at solving problems, fostering innovation, coming to wise decisions."

A NEW YORK TIMES BUSINESS BESTSELLER

"As entertaining and thought-provoking as *The Tipping Point* by Malcolm Gladwell. . . . *The Wisdom of Crowds* ranges far and wide."
—*The Boston Globe*

THE WISDOM
OF CROWDS

JAMES
SUROWIECKI

WITH A NEW AFTERWORD BY THE AUTHOR

communication
outsourcing
project
knowledge
management
ideas
rowdsourcig
reativity
intelligence
clients
collective
community
group
solution
collaboration

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Our Experience

Project Management

Software Engineering Degree

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Planning CLIL Lessons

Content Objectives

Objectives of the activity regarding **the content of the subject**

Example:

- To practice:
  - How to measure a project performance and progress in an objective manner applying EVM.
- To analyze:
  - Importance of ethics in SE & PM.

Language Objectives

Objectives of the activity regarding **the language**

Example:

Vocabulary

To learn specific terms regarding project performance and monitoring.

Speaking

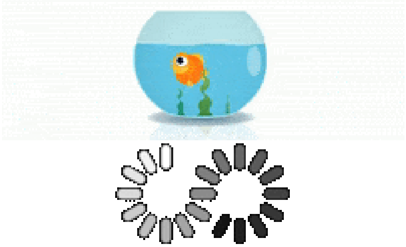
To interact with others using these the new terms in the context of a business meeting.

Speaking

To present a short summary of the project performance.

Educational approach

Open systems



Student-centered

THE Producer

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Searching for knowledge

I

What we know we know (visible assets)

II

Don't know we know (discovery)

III

Know we don't know (gaps)

IV

Don't know we don't know (unknown future)

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Listening

In Real Life...

Speaking

Resources & activities

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Producing knowledge

Vocabulary related

Applying the EVA technique

Reporting and presenting

PROFESSIONAL ETHICS

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Technical vocabulary

7th Grade Word List

14. centripetal
15. chicanery
16. chronicle
17. chrysanthemum
18. civilization
19. clandestine
20. clientele
21. collaborate
22. commencement
23. compulsory
24. conscientious
25. contiguous
26. credentials
41. epilogue
42. ergonomic
43. euphemism
44. evanescent
45. explosive
46. fastidious
47. fictitious
48. formidable
49. frequency
50. futurity
51. gaseous
78. miscellaneous
79. neutralize
80. nucleus
81. obligation
82. opossum
83. pamphlet
84. parfait
85. paucity
86. pedagogy
87. permeate
108. saxophone

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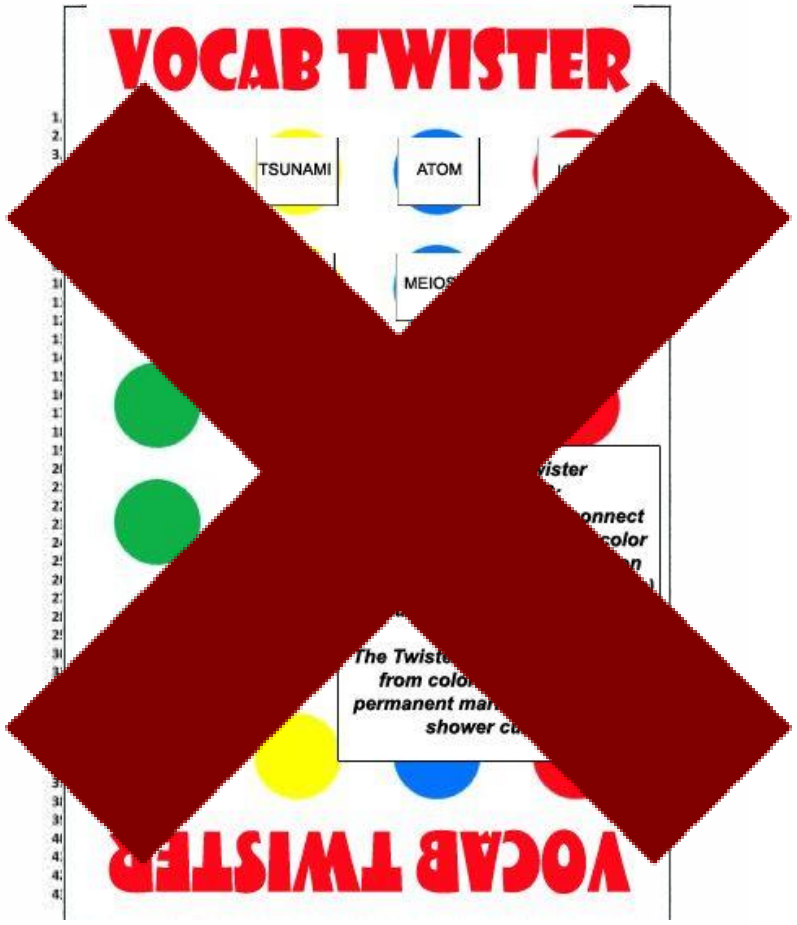
Technical vocabulary


VOCAB TWISTER
TSUNAMI
ATOM
VOCAB TWISTER

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Technical vocabulary

Creator

Quizlet

Quizlet Live

14.0 secs
16.0 secs
16.7 secs

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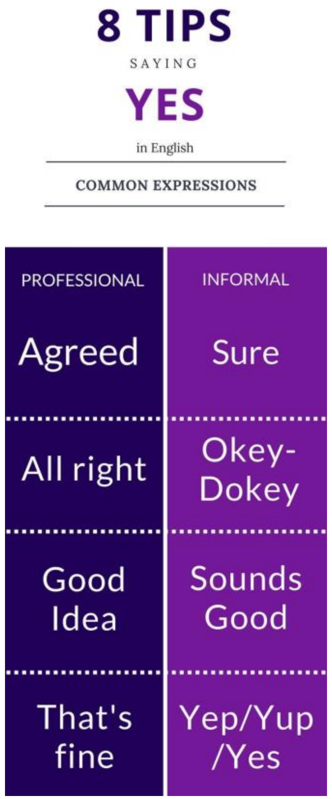
Useful expressions



8 TIPS
SAYING
YES
in English

COMMON EXPRESSIONS

PROFESSIONAL	INFORMAL
Agreed	Sure
All right	Okey-Dokey
Good Idea	Sounds Good
That's fine	Yep/Yup /Yes

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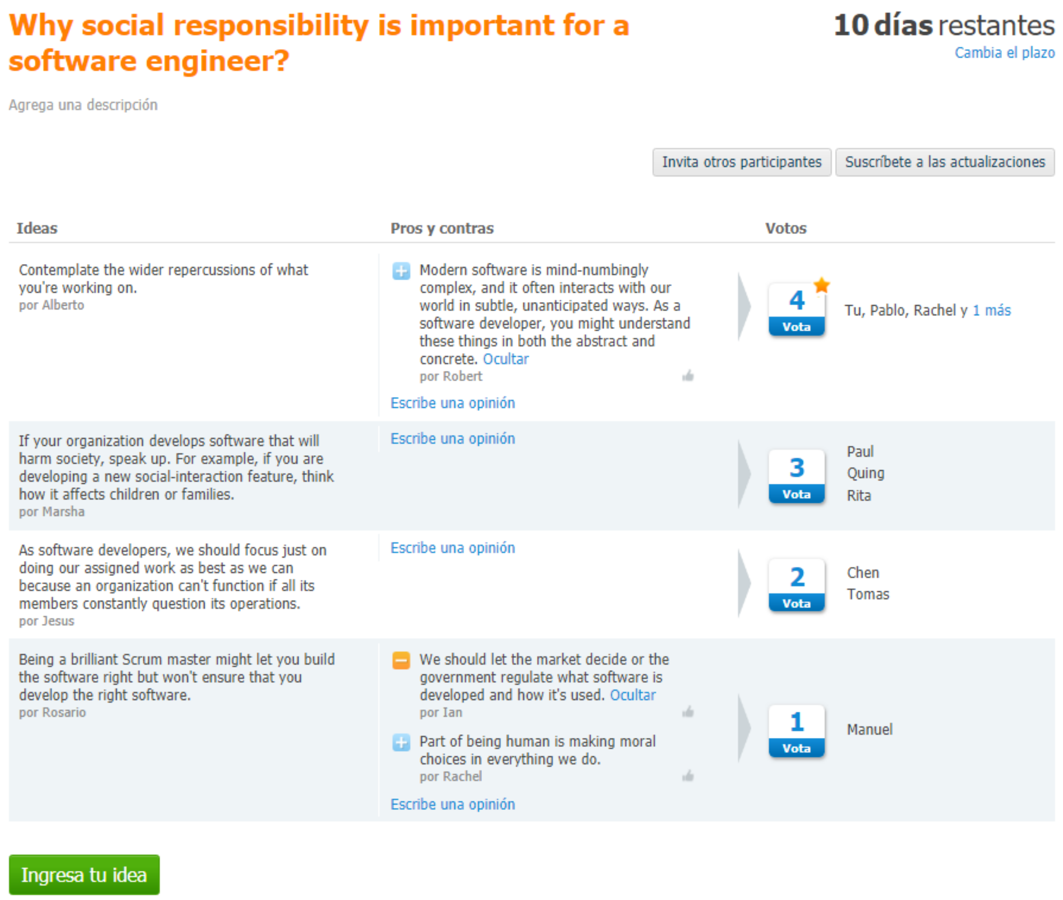
Ethics

tricider

SOCIAL MEDIA



Why social responsibility is important for a software engineer?

10 días restantes
Cambia el plazo

Agrega una descripción

Invita otros participantes | Suscríbete a las actualizaciones

Ideas	Pros y contras	Votos
Contemplate the wider repercussions of what you're working on. por Alberto	➕ Modern software is mind-numbingly complex, and it often interacts with our world in subtle, unanticipated ways. As a software developer, you might understand these things in both the abstract and concrete. Ocultar por Robert Escribe una opinión	4 Vota — Tu, Pablo, Rachel y 1 más
If your organization develops software that will harm society, speak up. For example, if you are developing a new social-interaction feature, think how it affects children or families. por Marsha	Escribe una opinión	3 Vota — Paul Quing Rita
As software developers, we should focus just on doing our assigned work as best as we can because an organization can't function if all its members constantly question its operations. por Jesus	Escribe una opinión	2 Vota — Chen Tomas
Being a brilliant Scrum master might let you build the software right but won't ensure that you develop the right software. por Rosario	➖ We should let the market decide or the government regulate what software is developed and how it's used. Ocultar por Ian ➕ Part of being human is making moral choices in everything we do. por Rachel Escribe una opinión	1 Vota — Manuel

Ingresa tu idea

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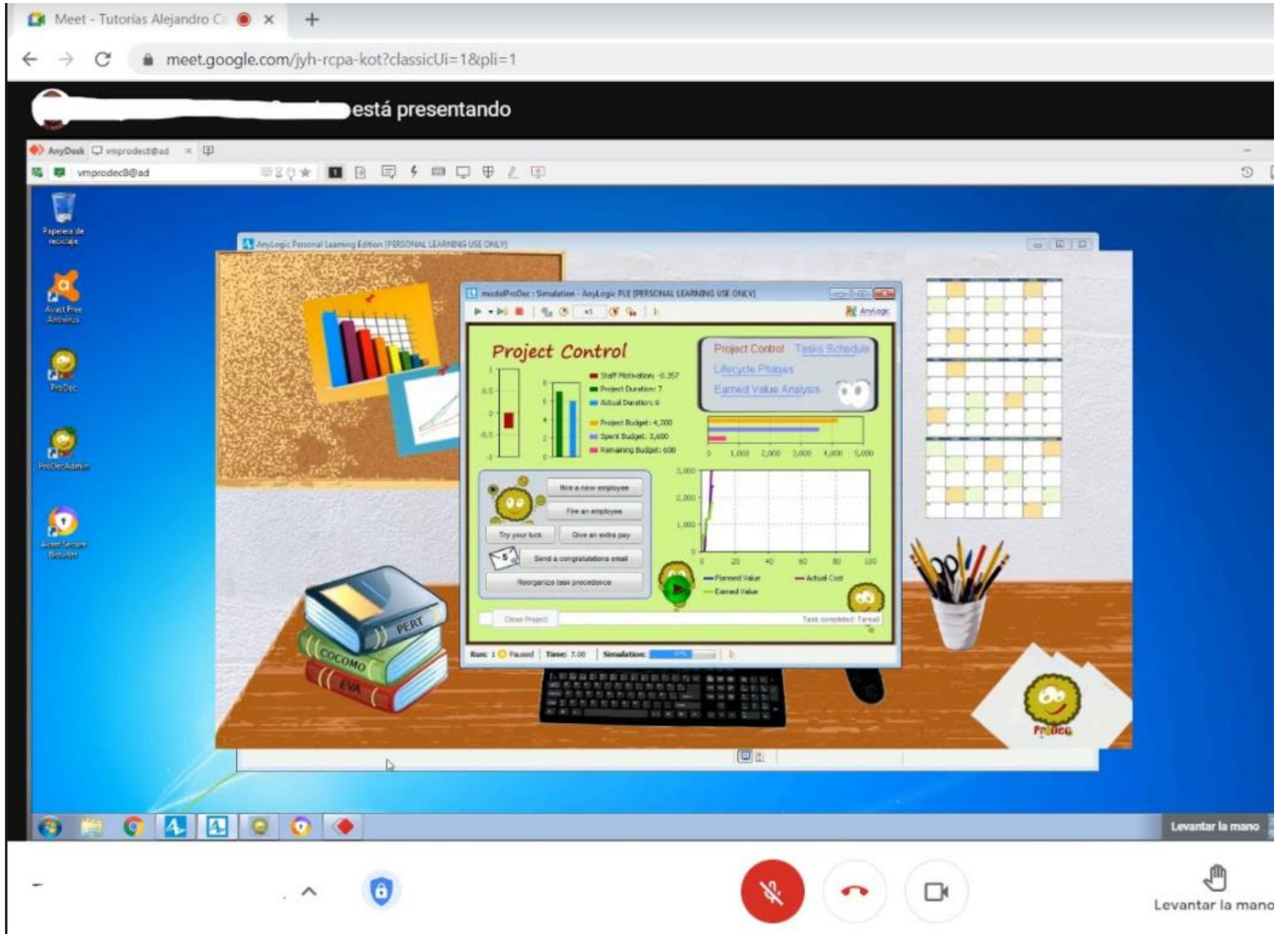
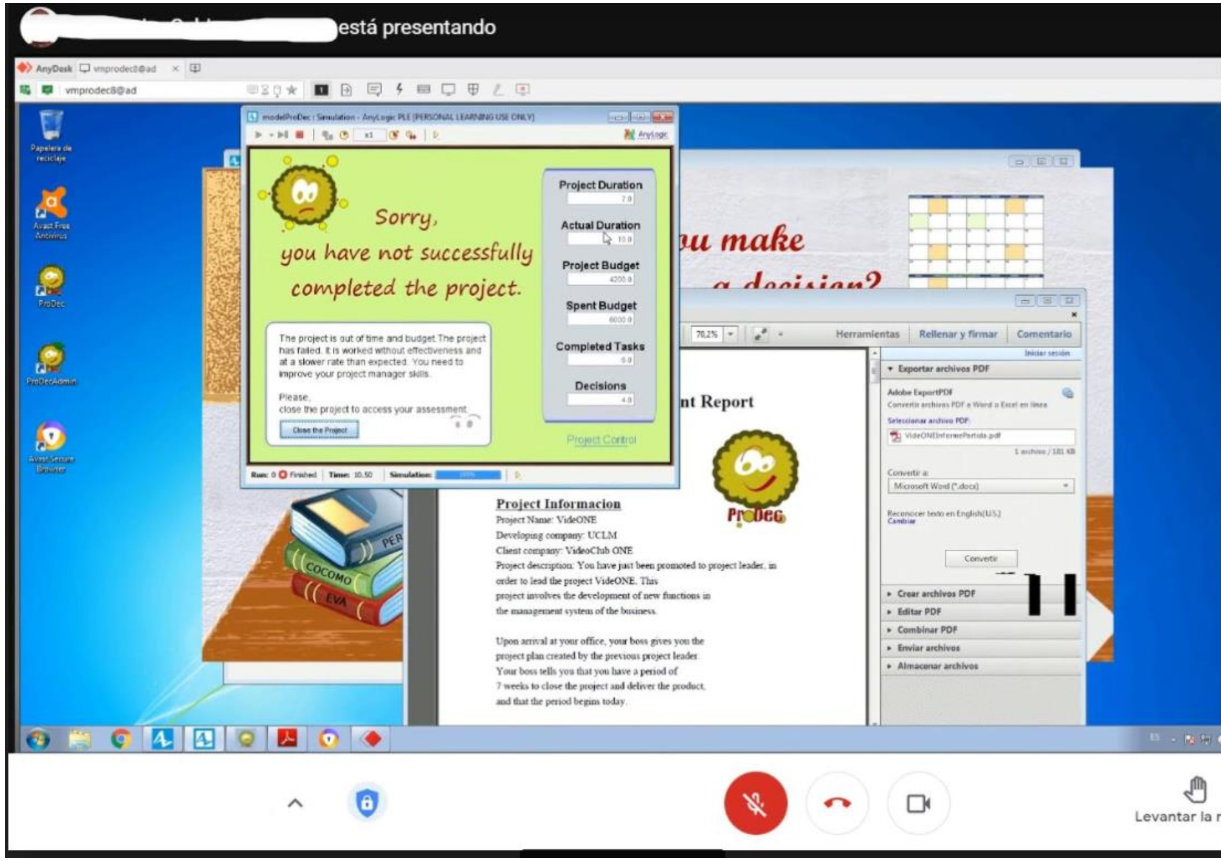

Meet - Tutorías Alejandro C
meet.google.com/jyh-rcpa-kot?classicUi=1&pli=1
AnyDesk
vmprodec8@ad
modelProDec : Simulation - AnyLogic PLE [PERSONAL LEARNING USE ONLY]
Project Control
Tasks Schedule
Lifecycle Phases
Earned Value Analysis
Hire a new employee
Fire an employee
Try your luck
Give an extra pay
Send a congratulations email
Reorganize task precedence
Planned Value
Actual Cost
Earned Value
Close Project
Levantar la mano

[redacted] está presentando

Staff Motivation: -0.357
Project Duration: 7
Actual Duration: 6
Project Budget: 4,200
Spent Budget: 3,600
Remaining Budget: 600

Task completed: Tarea8

Run: 1 Paused | Time: 7.00 | Simulation:


AnyDesk
vmprodec8@ad
modelProDec : Simulation - AnyLogic PLE [PERSONAL LEARNING USE ONLY]
Close the Project
Project Control
Herramientas
Rellenar y firmar
Comentario
Exportar archivos PDF
Crear archivos PDF
Editar PDF
Combinar PDF
Enviar archivos
Almacenar archivos
Levantar la

[redacted] está presentando

Sorry,
you have not successfully completed the project.

The project is out of time and budget. The project has failed. It is worked without effectiveness and at a slower rate than expected. You need to improve your project manager skills.

Please,
close the project to access your assessment.

Project Duration: 7.0
Actual Duration: 10.0
Project Budget: 4200.0
Spent Budget: 6000.0
Completed Tasks: 6.0
Decisions: 4.0

Run: 0 Finished | Time: 10.50 | Simulation:

nt Report

Project Informacion
Project Name: VideONE
Developing company: UCLM
Client company: VideoClub ONE
Project description: You have just been promoted to project leader, in order to lead the project VideONE. This project involves the development of new functions in the management system of the business.

Upon arrival at your office, your boss gives you the project plan created by the previous project leader. Your boss tells you that you have a period of 7 weeks to close the project and deliver the product, and that the period begins today.

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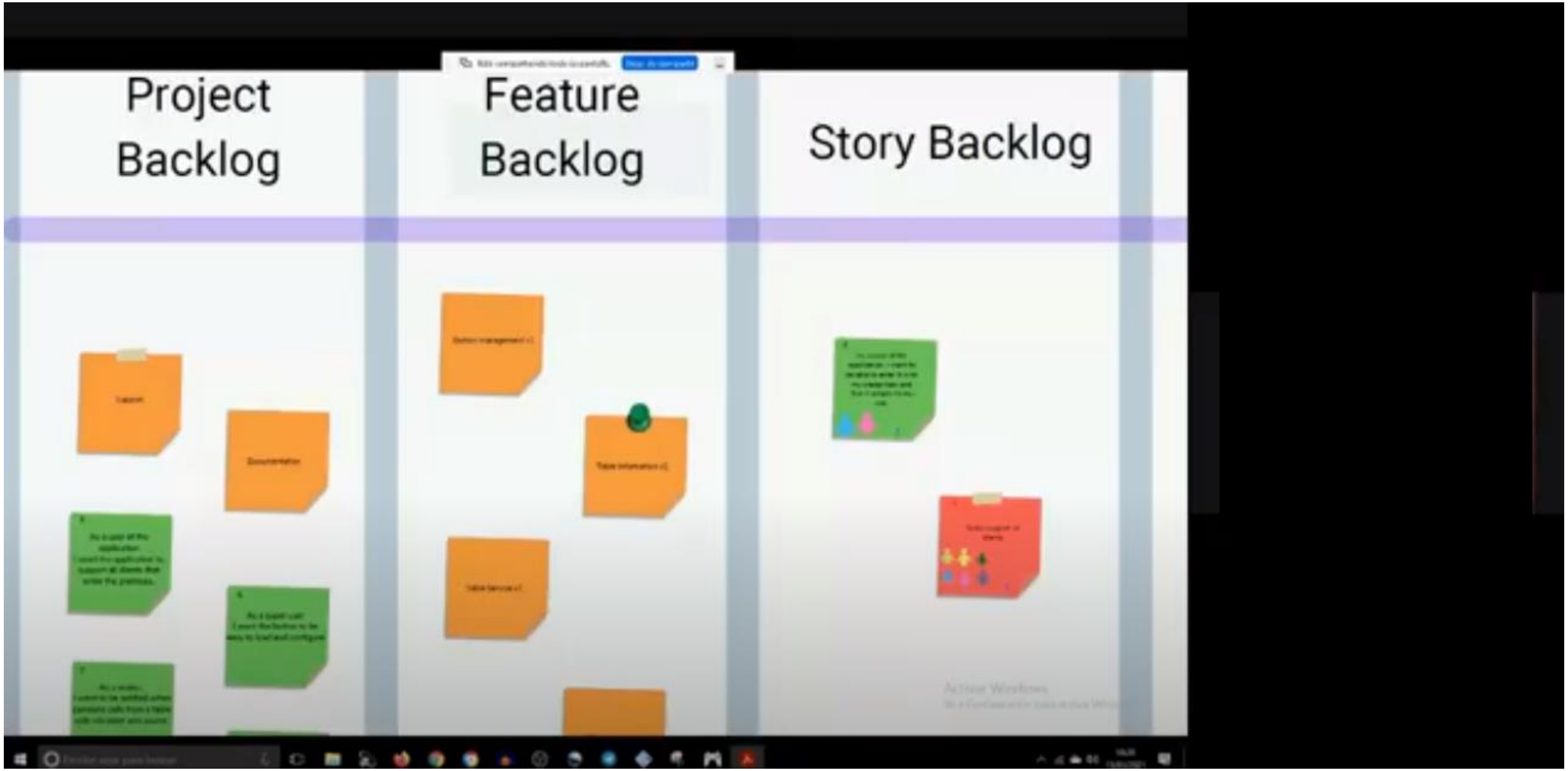
Project Backlog
Feature Backlog
Story Backlog

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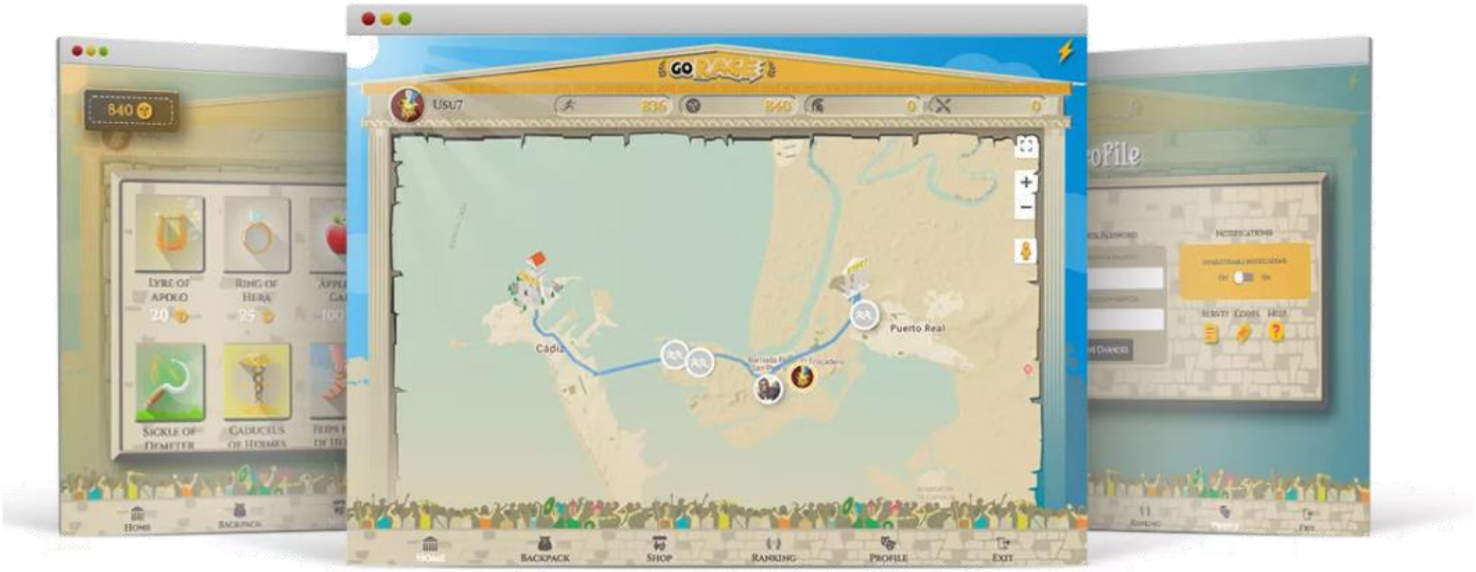
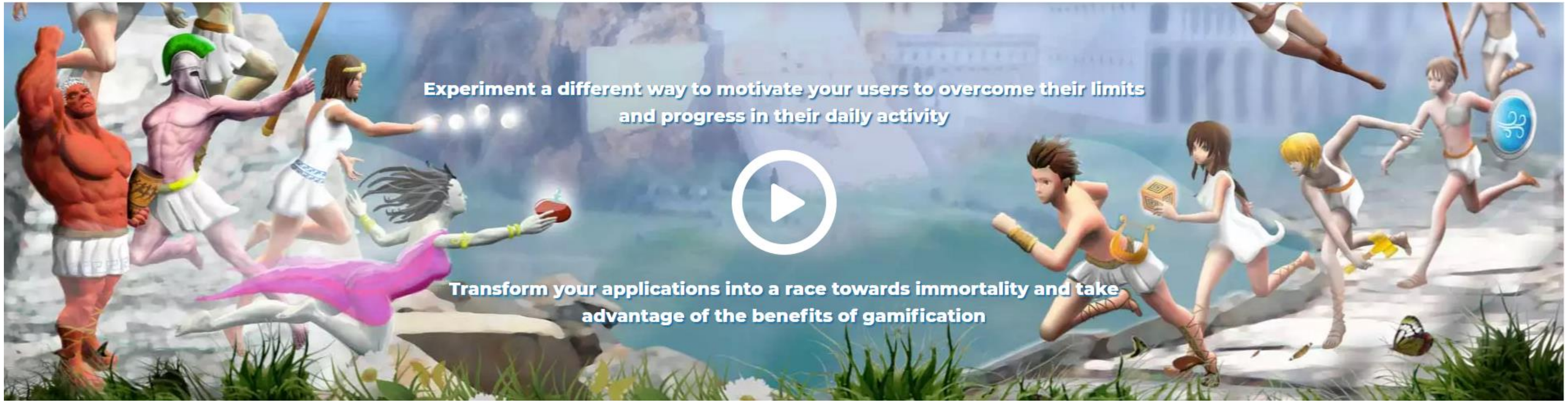

GO RACE
840
Usu7
836
840
Lyre of Apolo
20
Ring of Hera
25
Sickle of Demeter
Caduceus of Hermes
Cádiz
Puerto Real
Profile
Notifications
Home
Backpack
Shop
Ranking
Profile
Exit

GO RACE



Experiment a different way to motivate your users to overcome their limits and progress in their daily activity

Transform your applications into a race towards immortality and take advantage of the benefits of gamification

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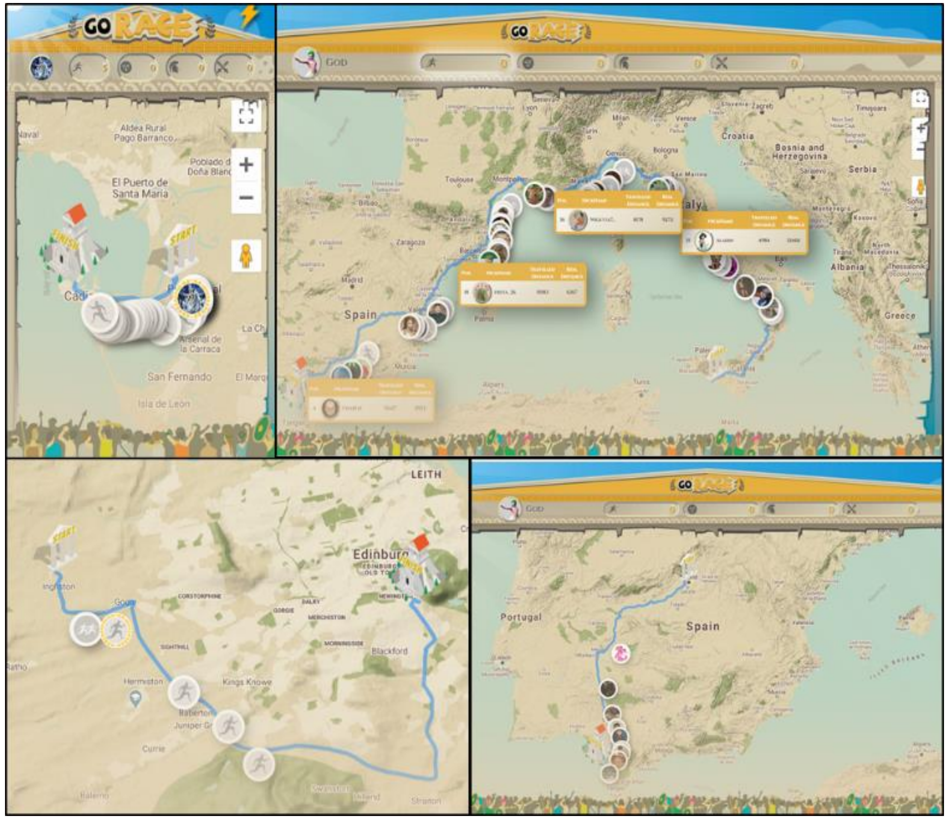
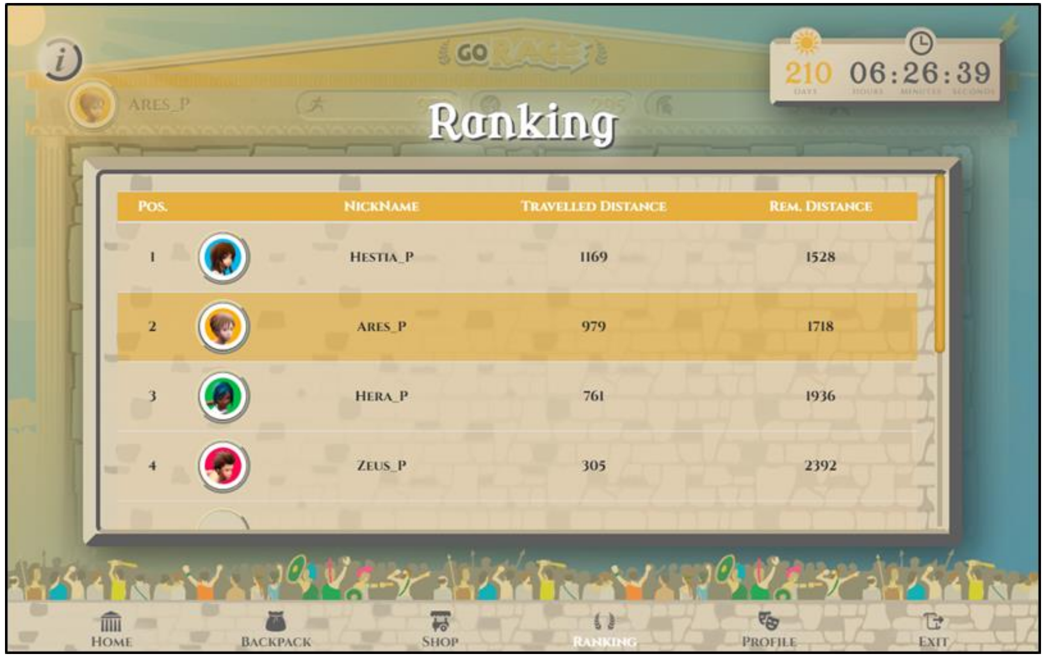
GO RACE



GO RACE
GOD
START
FINISH
El Puerto de Santa María
San Fernando
Spain
Portugal
Croatia
Bosnia and Herzegovina
Serbia
Greece
Edinburgh
LEITH



GO RACE
ARES_P
210 06:26:39
DAYS HOURS MINUTES SECONDS
HOME
BACKPACK
SHOP
RANKING
PROFILE
EXIT

Ranking

Pos.	Nickname	Travelled Distance	Rem. Distance
1	Hestia_P	1169	1528
2	Ares_P	979	1718
3	Hera_P	761	1936
4	Zeus_P	305	2392

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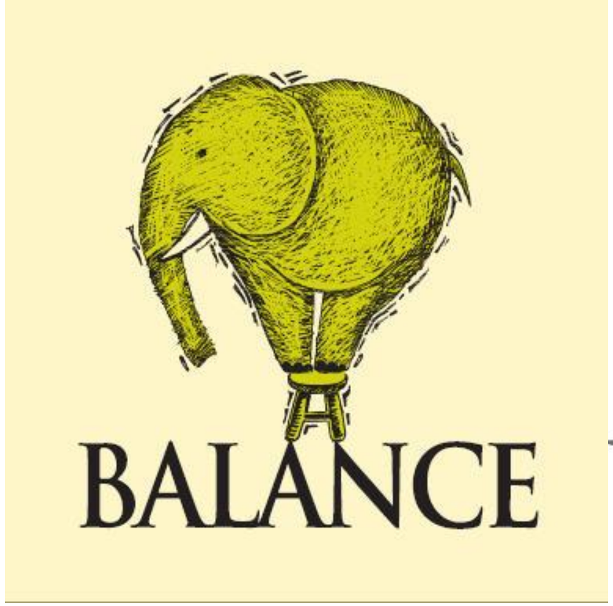
LEARNING
LEARNING
LEARNING

Lessons learned

Lesson #1

Avoid Pitfalls

WHAT TO DO WHEN THERE'S TOO MUCH TO DO
TO-DO LIST



9
8
7
Class
TIME

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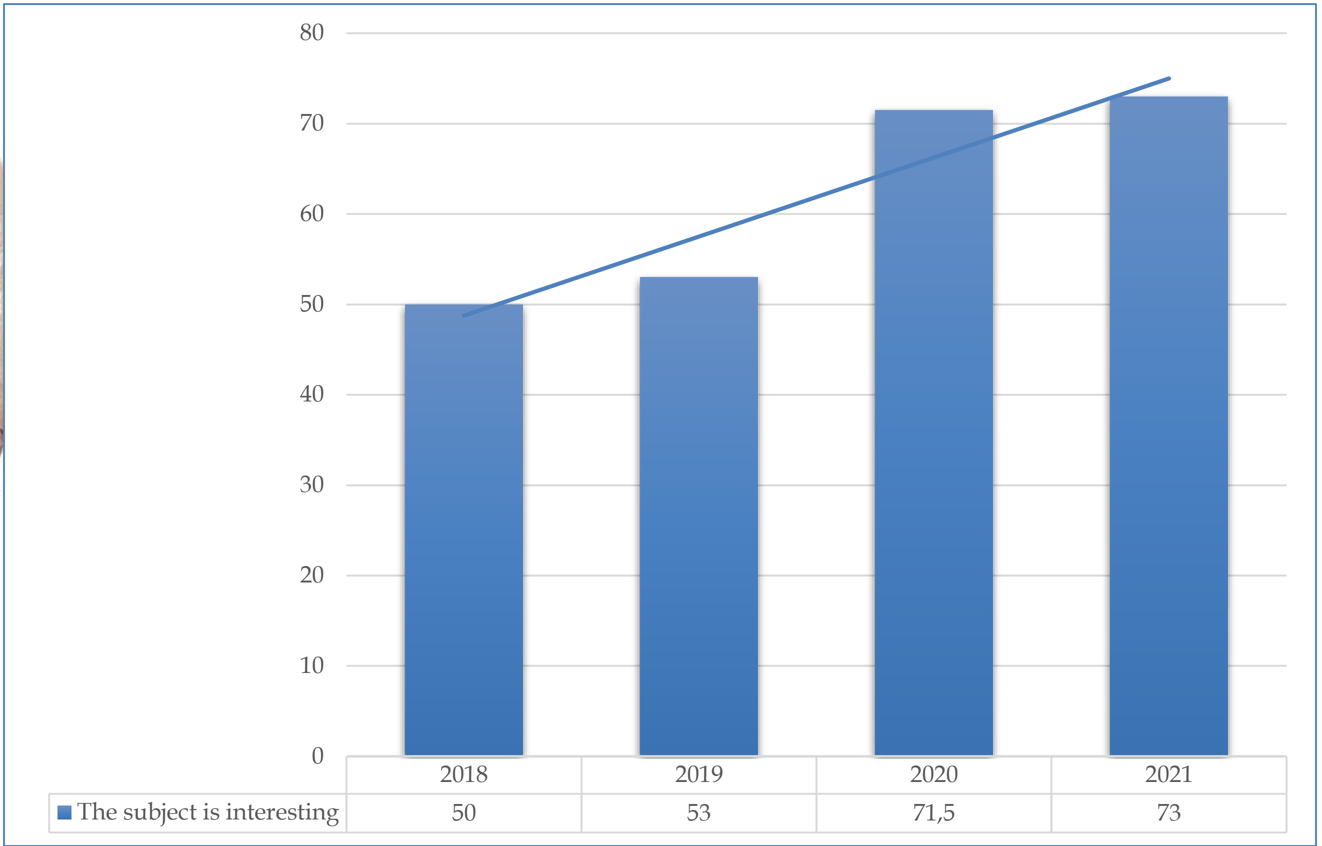
Lesson #2

Improved motivation

INTERESTING



	2018	2019	2020	2021
■ The subject is interesting	50	53	71,5	73

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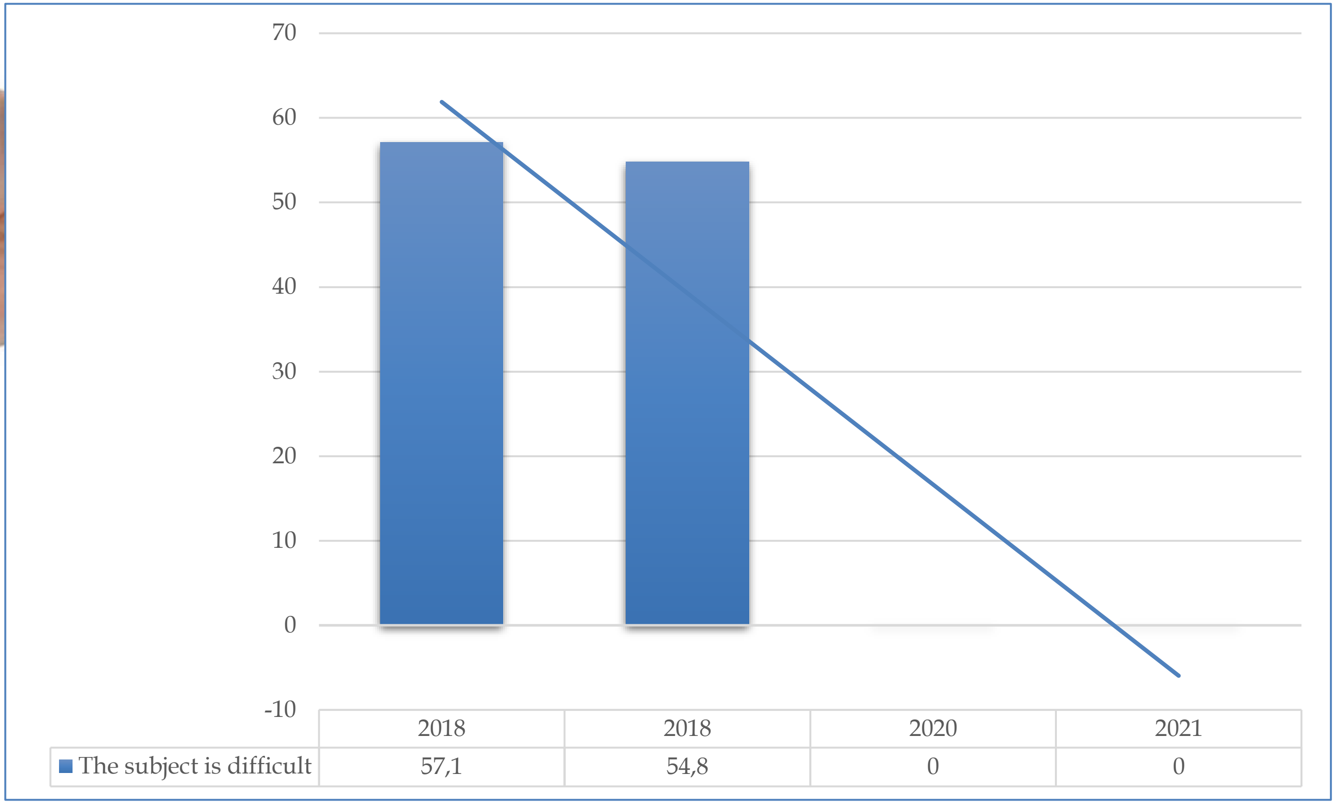
Lesson #2

Improved motivation



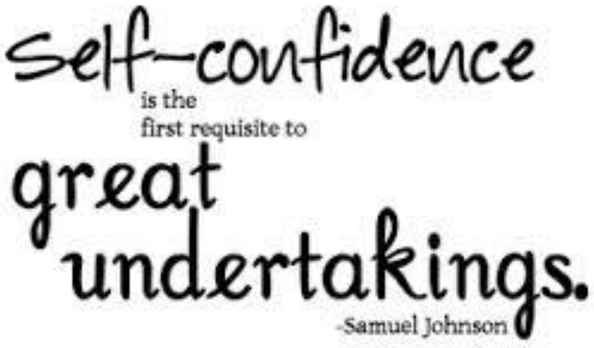
	2018	2018	2020	2021
■ The subject is difficult	57,1	54,8	0	0

Lesson #3

Improved self-confidence

COMMON EUROPEAN FRAMEWORK OF REFERENCE FOR LANGUAGES

B1



Self-confidence is the first requisite to great undertakings.

-Samuel Johnson

Lesson #4

Same contents, far more learning

UCA

Mercedes Ruiz, Ph.D.

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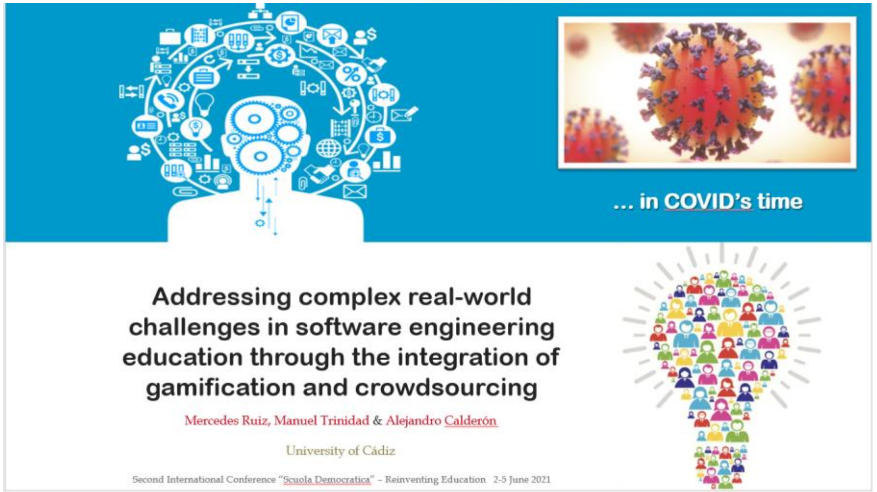
Software Process Improvement and Formal Methods Research Group (SPI&FM)
University of Cadiz

Escuela Superior de Ingeniería
Avenida de la Universidad de Cádiz, 10
11519 - Puerto Real (Cádiz)
SPAIN

mercedes.ruiz@uca.es



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