

E-learning experience @ Eurecat

May, 19, 2020



INFORMATION COMPETENCE AS BOOSTER
FOR PROSPECTIVE SCIENTISTS

Introduction

Experience from research to professional projects development

EdTech - E-Learning

Research - Innovation - Development – Provider

Introduction

User centered design vs. purpose driven design

Introduction



Intelligent Tutoring systems



Learning analytics projects



Training recommendation systems



LMS and training projects



Adaptive learning



VR and AR training solutions

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Intelligent Tutoring systems



Learning analytics projects



Training recommendation systems



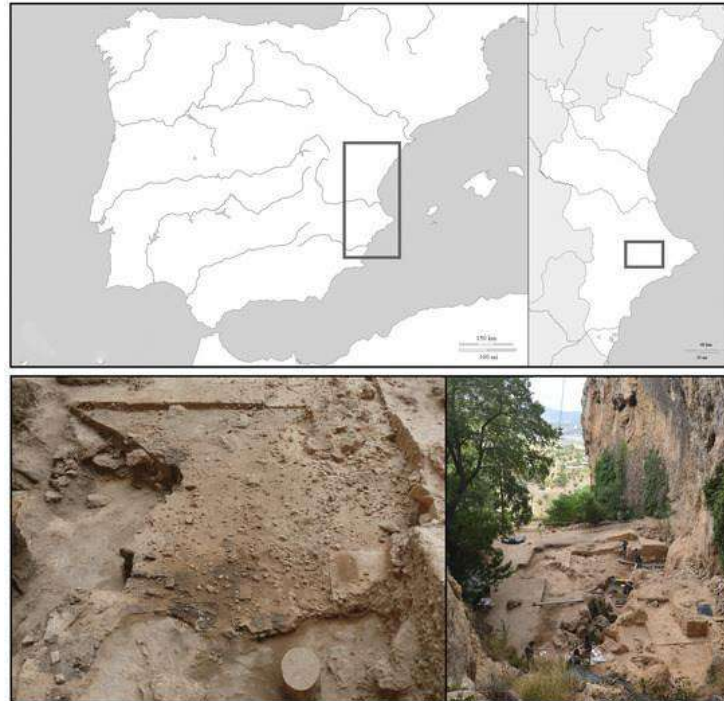
LMS and training projects



Adaptive learning

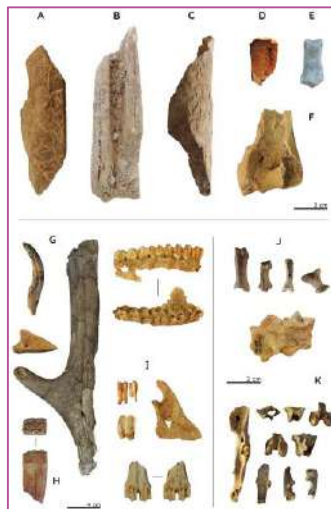
E-learning in archaeology

"El Salt" (Alicante, Spain)



E-learning in archaeology

The aim of this study is to build an intelligent tutoring system for zooarchaeology students while field practices



The objective is to help students to **classify animals from bone fragments in zooarchaeology**. The 3406 bone remains, which have 64 attributes, were obtained from the excavation of the Middle Palaeolithic site of El Salt (Alicante, Spain)

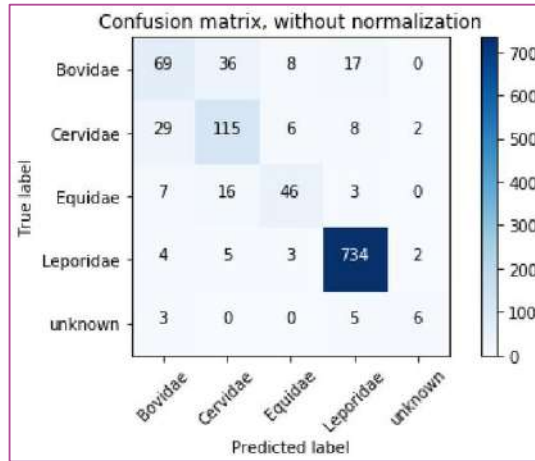
E-learning in archaeology

Table 2. Performance of the different methods in the coarse granularity. Synthetic minority over-sampling technique (SMOTE), support vector machine (SVM), k-nearest neighbors (KNN), adaptive synthetic (ADASYN).

Method (Parameters)	Accuracy	Precision (Weighted)	Recall (Weighted)	F1-Score (Weighted)
Random forest, SMOTE (classifier class weight: balanced, classifier max features: auto, classifier n estimators: 500)	0.86	0.86	0.86	0.86
SVM, SMOTE (classifier C: 100, classifier gamma: 0.001, classifier kernel: rbf)	0.74	0.81	0.74	0.77
Naive Bayes, SMOTE	0.68	0.76	0.68	0.66
Neural Networks, SMOTE (classifier solver: lbfgs, classifier alpha: 1×10^{-5})	0.67	0.75	0.67	0.71
KNN, SMOTE (classifier n neighbors: 3)	0.75	0.79	0.75	0.77
Random Forest, ADASYN (classifier class weight: balanced, classifier max features: auto, classifier n estimators: 100)	0.86	0.85	0.86	0.86
SVM, ADASYN (classifier C: 100, classifier gamma: 0.001, classifier kernel: rbf)	0.72	0.80	0.72	0.75
Naive Bayes, ADASYN	0.68	0.78	0.68	0.65
Neural Networks, ADASYN (classifier solver: adam, classifier alpha: 1×10^{-5})	0.67	0.79	0.67	0.72
KNN, ADASYN (classifier n neighbors: 3)	0.74	0.79	0.74	0.76

E-learning in archaeology

This study uses machine learning techniques to help students to classify bone fragments.



Random forest was the method which had better results between the tested ones, with an accuracy and f1-score of 0.86 for both.

Most relevant attributes for the prediction were also found.

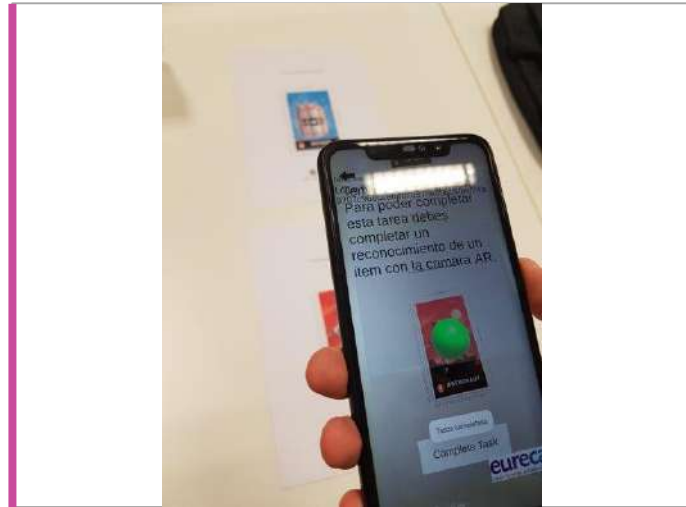
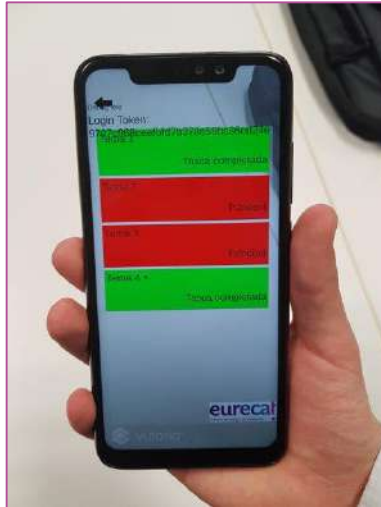
E-learning in archaeology

This first version of the ITS was used in August 2019 by 3 students to classify 51 remains that were characterized following the format of the same database but belonged to a different archaeological site called “Abric del Pastor”.

The results of the tutor, compared to the predictions of the students frequently agreed even when the remains used for training corresponded to a different site (“El Salt”). Students, due to their limited knowledge and the difficulties of analyzing very fragmented bone remains, usually described the remains based only on the size, which usually agree with the families predicted by the tutor.

Augmented workplace

Execution platform for the intelligent tutor in augmented reality (AR) for industry 4.0. Communication between AR device (mobile version) with tasks defined in the LMS. The second example incorporates the identification of objects / marks to, for example, be able to mark tasks as completed.



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Adaptive learning

SkillsMatch

<https://demo.skillsmatch.eu>

This project measures and validates soft skills. It also creates individual training roadmaps and influences the future of employability.

ASSESSMENT

Select your favorite occupations 📌

See the soft skills required for different occupations.

policy manager 🔍 Can't find you occupation? [Try this >](#)

📌 Favorite occupations: Policy Manager 13 🗑️

Filter soft skills by: Show All Skills

Policy Manager

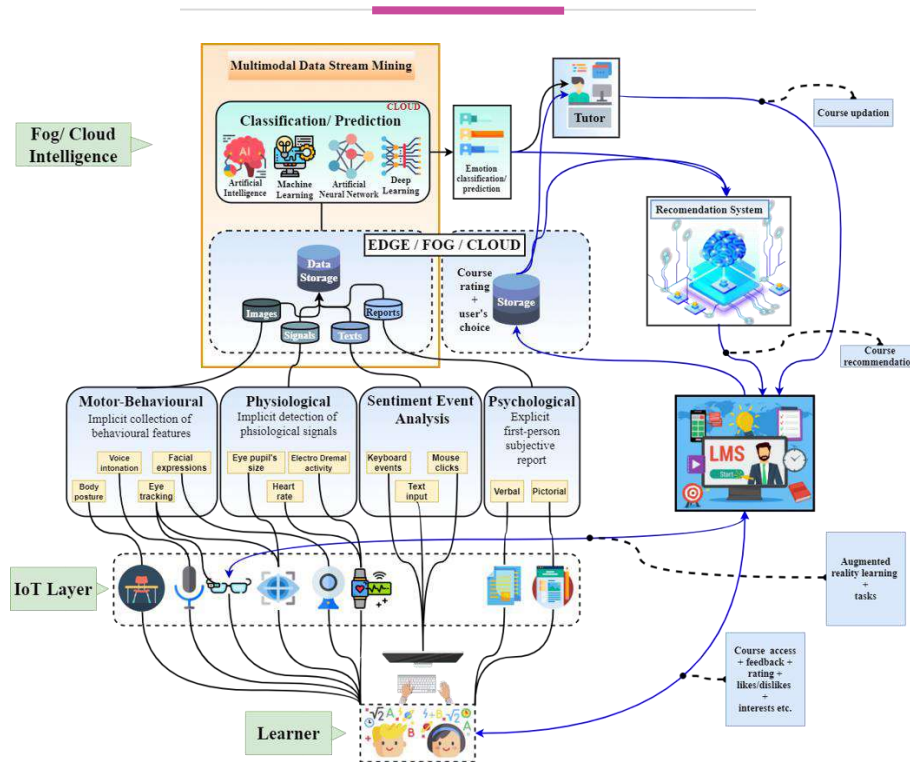
Communication	Teamwork	Problem-solving	Adaptability	Personal development	Ethical behaviour
Motivation	Self-control	Organisation	Positive attitude	Efficiency	Critical thinking
Leadership	Initiative	Reliability	Self-management	Decision making	Networking
Negotiation	Creativity	Accountability	Respect for diversity	Diligence	Resilience
Tenacity	Entrepreneurship	Customer focus	Goal orientation	Conflict resolution	Coaching
Respect the environment	Strategic thinking	Patience	Manage quality	Respect privacy	Motivate others

Soft skills	Completion	Courses	Required skills	Level
Communication	██████████	🔍	🟡	_____
Teamwork	██████████	🔍	○	_____
Problem-solving	██████████	🔍	🟡	_____
Adaptability	██████████	🔍	○	_____
Personal development	██████████	🔍	○	_____
Ethical behaviour	██████████	🔍	🟡	_____
Motivation	██████████	🔍	○	_____
Self-control	██████████	🔍	🟡	_____
Organisation	██████████	🔍	○	_____
Positive attitude	██████████	🔍	○	_____
Diligence	██████████	🔍	○	_____
Resilience	██████████	🔍	○	_____
Tenacity	██████████	🔍	○	_____
Entrepreneurship	██████████	🔍	○	_____
Customer focus	██████████	🔍	○	_____
Goal orientation	██████████	🔍	🟡	_____
Conflict resolution	██████████	🔍	○	_____
Coaching	██████████	🔍	🟡	_____
Respect the environment	██████████	🔍	○	_____
Strategic thinking	██████████	🔍	○	_____
Patience	██████████	🔍	○	_____
Manage quality	██████████	🔍	○	_____
Respect privacy	██████████	🔍	🟡	_____
Motivate others	██████████	🔍	🟡	_____

📌 Courses: 5 📌 Soft skills: 13 📌 Approved: 1

Real-time processing data streams in learning scenarios

Recommendation of courses in real-time considering emotional states



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Adaptive learning

E-learning in transnational programs: Entrepedia

- To help the inclusion of information and communication technologies (ICTs) in transnational programs
- To present the theoretical background, the gamification and adaptive techniques included in the model and the platform where the courses are implemented.
- To create an immersive learning environment we applied:
 - **Bloom's taxonomy** categorizes and orders thinking skills. We use Lorin Anderson's revised Bloom's taxonomy starting from remembering, understanding, applying, analyzing, evaluating to creating.
 - **Kapp and O'Driscoll** envision a work/learn culture where learning is perceived as optimizing networks.
 - **Flow** is the state of complete absorption when completing a task. To achieve flow, you need intrinsic motivation, a challenging task and the skills to perform it, and an active and engaging task defined by clear factors of success.

E-learning in transnational programs

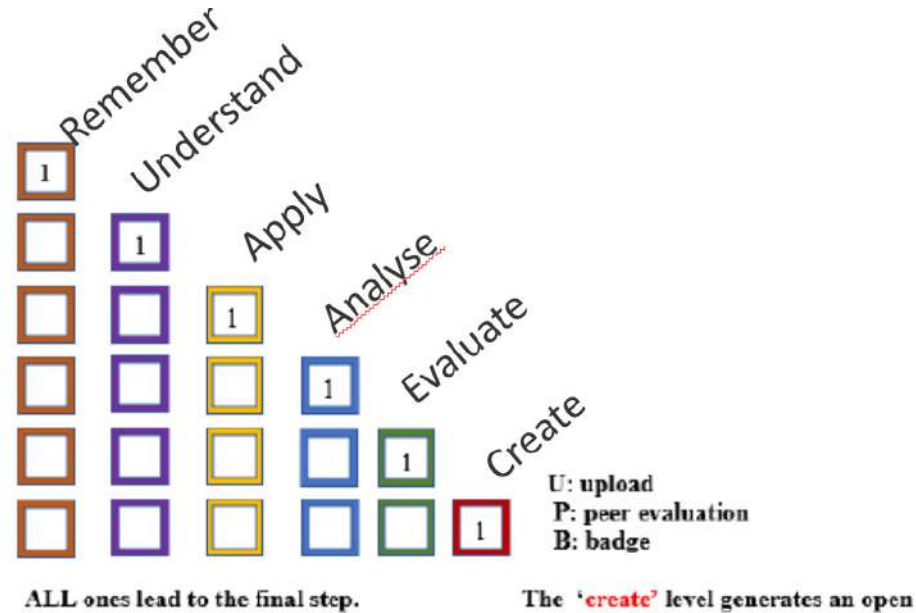


Figure 1: Schematic representation of the course

E-learning in transnational programs

[ADeAPTIVE] Entrepreneurship course

Home / My courses / [ADeAPTIVE] entrepreneurship

General



Assessments

Introduction

Introduction

Well-being

FRESH START 1: Creating an international entrepreneurship mind-set Lesson

FRESH START 2: Becoming your own pilot Lesson

Elevarer pitch example (video)

The Successful Elevarer Pitch (2020)

After lecture of business student Andrea Lagay explains how to give a successful investor pitch. She a member of ADePTive courses team A2C "Well-being", which recently won all the Global Entrepreneurship Challenge competitions awards: Mass Innovation Hub, Best Global Pitch and Grand Champion. A2C also won the Lightning Award at the University of Georgia. Her, Yashini, Theamandira and Mayank the Georgia team in Atlanta. The ADePTive school at ADePTive took a world record 40 first place Global Entrepreneurship Challenge since 1999 and A2C's success have won them a berth into "Global MENT" Camp, the world's most successful business competition. This means the rights to conduct your the University of Georgia has won a berth, the "AdePTive" is the very Canadian school, and one of only a handful in the world to accomplish this.

Class

My journey

Assignment 1

Assignment 2

Question 1.1

Question 1.2

Question 1.3

Question 1.4

Question 1.5

Question 1.6

Question 1.7

Question 1.8

Question 1.9

Question 1.10

Question 1.11

Question 1.12

Question 1.13

Question 1.14

Question 1.15

Question 1.16

Not available unless You get an appropriate score in Question 2.3 (hidden otherwise)

Question 2.5

Not available unless You get an appropriate score in Question 2.4 (hidden otherwise)

Question 3.1

Not available unless You achieve a required score in Question 3.2 (hidden otherwise)

Question 3.2

Not available unless You achieve a required score in Question 3.3 (hidden otherwise)

Question 3.3

Not available unless You get an appropriate score in Question 3.4 (hidden otherwise)

Question 3.4

Not available unless You achieve a required score in Question 2.1 (hidden otherwise)

Question 4.1

Not available (hidden) unless any of:

- You achieve a required score in Question 3.1

- You achieve a required score in Question 4.2

- You achieve a required score in Question 4.3

Question 4.2

Not available unless You get an appropriate score in Question 4.1 (hidden otherwise)

Question 4.3

Not available unless You get an appropriate score in Question 4.2 (hidden otherwise)

Question 5.1

Not available (hidden) unless any of:

- You achieve a required score in Question 4.1

- You achieve a required score in Question 5.2

Question 5.2

Not available unless You get an appropriate score in Question 5.1 (hidden otherwise)

Question 6.1

Not available unless You achieve a required score in Question 5.3 (hidden otherwise)

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systems



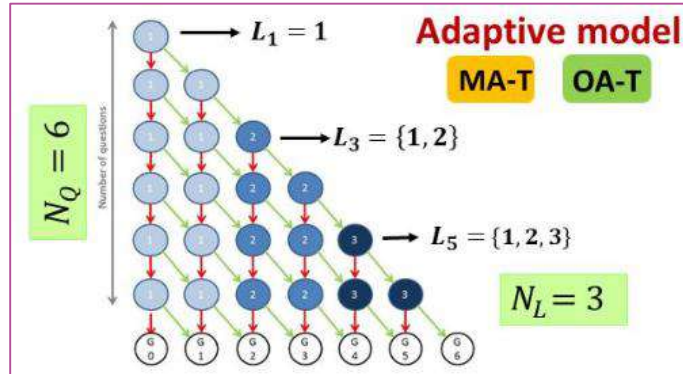
LMS and training projects



Adaptive learning

E-learning during Covid-19

Influence of COVID-19 confinement in students' performance in higher education



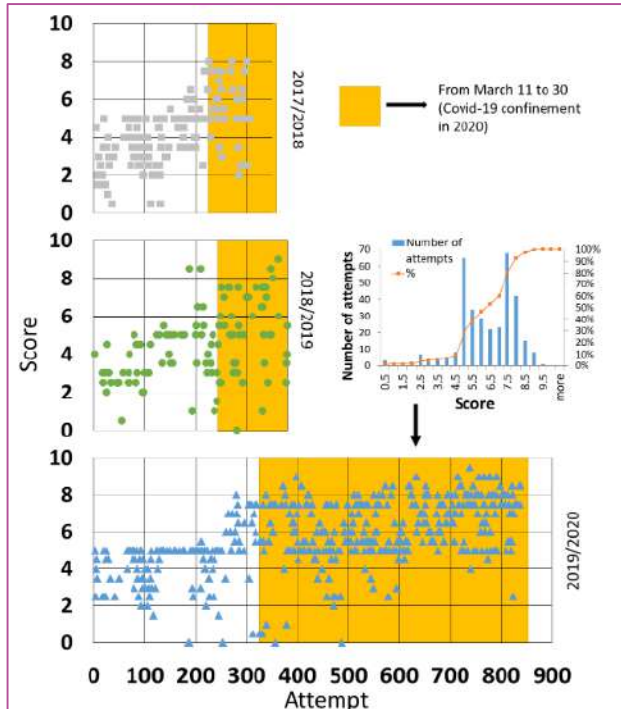
Using a field experiment of 458 students from three different subjects in Universidad Autónoma de Madrid (Spain), we study the differences in assessments by dividing students into two groups.

The first group (control) corresponds to academic years 2017/2018 and 2018/2019. The second group (experimental) corresponds to students from 2019/2020, which is the group of students that interrupted their face – to – face activities because of the confinement.

The results show that there is a significant positive effect of the COVID - 19 confinement on students' performance

E-learning during Covid-19

Materials, methods and results (applied computing)



We have used two online platforms. The first one is e-valUAM, an online platform that aims to increase the quality of tests by improving the objectivity, robustness, security and relevance of content. e-valUAM implements all the (Computed-adapted test) CAT tests. The second online platform used in this study is the Moodle platform provided by the Biochemistry Department from Universidad Autónoma de Madrid, where all the tests that do not use adaptive questions are implemented.

Adaptive tests have been used in the subjects “Applied Computing” and “Design of Water Treatment Facilities”. Traditional tests have been used in the subject “Metabolism”.

E-learning during Covid-19

Metabolism

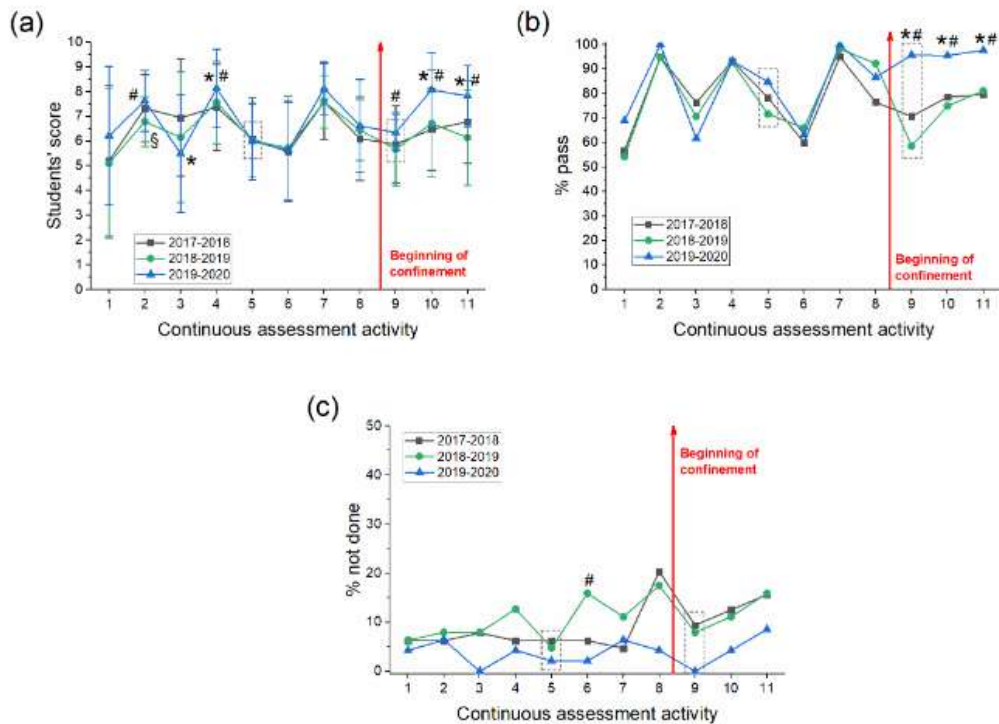
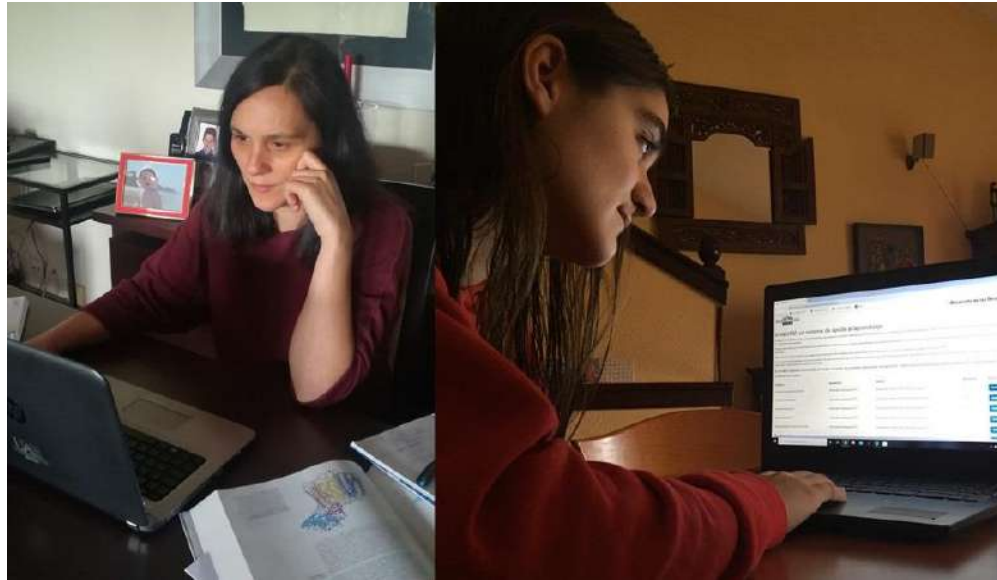


Fig 8. Results of students enrolled in Metabolism during the last 3 academic years.

E-learning during Covid-19

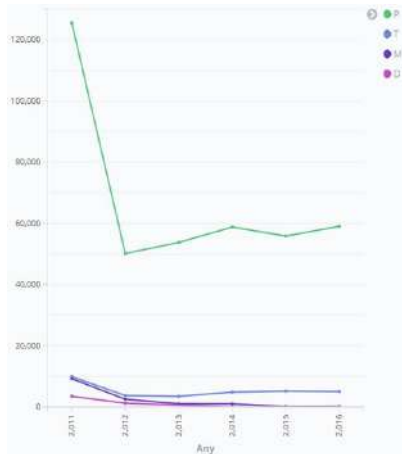
1. Students marks are approximately 2 point over 10 better
2. Students who pass goes from 70 to 90%
3. Participation goes from 85% to 95%



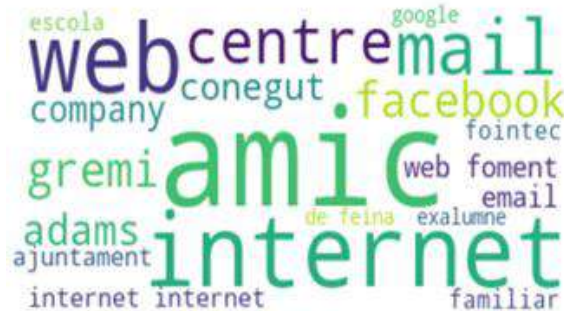
E-learning during Covid-19

1. Is there any effect (positive or negative) of COVID-19 confinement in students' performance? *There is a significant positive effect of COVID-19 confinement on students' performance.*
2. Is it possible to be sure that COVID-19 confinement is the origin of the different performance (if any)? *There are significant differences in students' performance after the confinement that cannot be found before in the same year or when comparing to the previous academic years.*
3. What are the reasons of the differences (if any) in students' performance? *Students can find by themselves many different motivations (rewards) to work on a continuous basis.*
4. What are the expected effects of the differences in students' performance (if any) in the assessment process? *Students get better grades in activities that did not change their format after the COVID-19 confinement. Moreover, we have demonstrated that there is an improvement in their learning performance.*

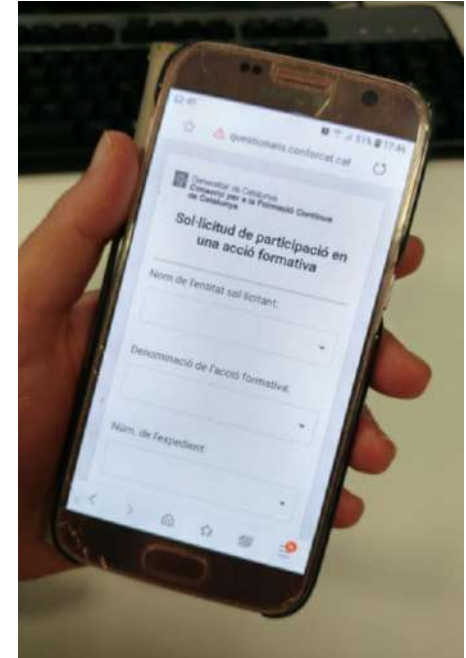
Evaluation of the satisfaction and applicability of the training actions of vocational training for employment for employed workers



Majority of presential learning



Text processing of source of knowledge of the course



Prototype to obtain data

Gap identification among continuous learning offering and market demands

- Big Data study in the social field to extract knowledge about the **Vocational Training offered and demanded**, in order to identify indicators and trends and set up an interactive map that facilitates decision-making and answers some of the key questions in the sector.
- To carry out the project, the Big Data CoE Barcelona, which manages the Eurecat technology center, will **evaluate large volumes of data corresponding to the history of the last five years**, in order to geographically characterize demand profiles and analyze how they evolve in the time the skills required.
- Phenomena such as **over-training or the impact of the evolution of demand on enrollments will be studied**, as well as different aspects related to **Dual and Occupational Vocational Training**. A comparison will also be made between labor supply and demand in two professional families representing the industrial and service sectors.

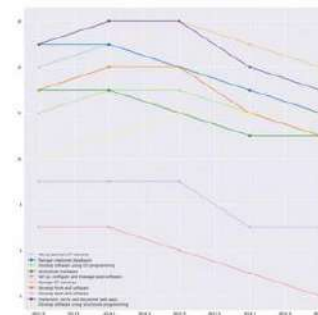


Fig. 5. Evolution of % of top 10 demanded skills with respect to the total ICT demand.

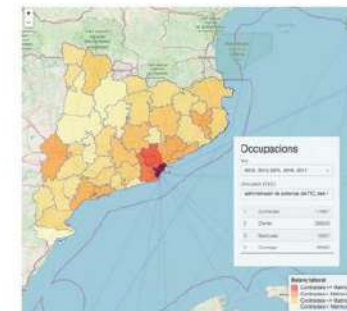


Fig. 6. Territorial analysis comparing between contracts and VET students for sys admins.

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Adaptive learning

Campus Virtual Eurecat Academy

eTraining Eurecat és una eina creada per oferir als nostres alumnes un suport virtual per complementar la formació presencial. El principal objectiu de la plataforma és fomentar el networking entre els alumnes, facilitar el contacte amb el professor i millorar l'accés als continguts del curs. Per poder facilitar la connexió en qualsevol moment i lloc, l'alumne també pot accedir a la plataforma eTraining Eurecat a través del seu telèfon mòbil o de una tablet.

Els meus cursos

<p>Contractació. Mòdul 2: El contracte de treball</p> <p>Ponent: Xavi Ruiz</p>	<p>CAM. Estratègies de mecanitzat</p> <p>Ponent: Sergi Baiges</p>	<p>Robòtica industrial i low cost</p>	<p>Noves tecnologies aplicades a la videoconferència, 2ª edició (15 hores)</p>
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Secartys

Training in Industry 4.0: Internet of Things and Machine learning

The image displays the Secartys website interface. On the left, a sidebar shows a navigation menu with icons for home, search, and settings. The main content area is titled 'Internet de las Cosas_TIC' and includes a breadcrumb trail: 'Página Principal > Módulos > Desarrollo de aplicaciones TIC en la industria 4.0: Del escritorio a la nube > Internet de las Cosas_TIC > Evaluación final'. Below this, two quiz questions are visible:


Pregunta 1
Sin responder aún.
Puntuación: 10/10.
¿Para qué se puede usar internet?
Seleccione una:
 Navegar por la web.
 Consultar el correo electrónico.
 Ver películas.
 Todas las anteriores y muchas más.

Pregunta 2
Sin responder aún.
Puntuación: 10/10.
¿Qué es un dominio de internet?
Seleccione una:
 Un tipo de dispositivo.
 Un servidor donde publicar información.
 Lo mismo que una dirección IP.
 Un nombre que sirve para recordar más fácilmente una dirección IP.


The right side of the image shows a grid of course cards:

- La Industria 4.0: Pilares y Estrategias**
Apertura el 15/04/2020
Cierre el 05/06/2020
El capítulo "La industria 4.0 pilares y estrategias" pretende abordar los ejes clave del origen de la industria 4.0 y su descripción. En este capítulo se describe el concepto, tendencias y tecnologías clave que caracterizan a la industria 4.0. Y lo que es más importante, brinda comprensión sobre por qué las empresas deberían apostar por la transformación digital.
- Sistema de control industrial e infraestructuras inteligentes**
Apertura el 24/04/2020
Cierre el 14/05/2020
El capítulo "Sistema de control industrial e infraestructuras inteligentes" pretende abordar los diferentes sensores y sus tipos, así como las diferentes redes inalámbricas que se componen. Otros aspectos en los que profundiza son las tecnologías y arquitecturas de las redes de sensores, y sus aplicaciones en los sensores de fabricación digital.
- Internet de las Cosas**
Apertura el 03/05/2020
Cierre el 02/06/2020
El capítulo "Internet de las cosas" pretende abordar una breve introducción a Internet, la definición de Internet de las cosas así como sus principales componentes, tecnologías y arquitecturas. También se detalla el acondicionamiento de la señal así como su conversión de señal analógica a digital.
- Machine learning. Análisis de datos**
Apertura el 10/06/2020
Cierre el 10/07/2020
El capítulo "Machine learning. Análisis de datos" pretende abordar los fundamentos del aprendizaje
- Ciberseguridad**
Apertura el 29/06/2020
Cierre el 19/07/2020
El capítulo "Ciberseguridad" explica cómo cualquier organización empresarial inmersa en los procesos de transformación digital, está expuesta a los riesgos y

Training for trainers platform



Generalitat de Catalunya
Consorci per a la Formació Continua de Catalunya



Centre Tecnològic de Catalunya

QÜESTIONARI D'ANÀLISI DE LES NECESSITATS FORMATIVES DEL PERFIL: FORMADOR.

Apreciat/Apreciada,

Li demanem, si us plau, que emplei aquest qüestionari ANÒNIM i CONFIDENCIAL* sobre la formació de formadors i de tutors en el marc de la formació professional per a l'ocupació (FPO). La durada d'aquest és de 15 minuts i pot contestar fins el dia

El qüestionari s'organitza en dos parts:

- Primera part: li sol·licitem dades de caràcter socioprofessional.
- Segona part: li presentem el model competencial desitjable per al perfil Formador, i ha de valorar en una escala 1 a 5 (baixa necessitat formativa/ 5 alta necessitat formativa) les necessitats formatives del seu col·lectiu.

Ens comprometem a fer-li un retorn dels resultats obtinguts i el/la convidem a continuar participant en el Grup de Co-Creació del projecte.

Pot posar-se en contacte amb nosaltres a través del següent correu electrònic i/o número de telèfon: laura.lopez.colvo@eurecat.org; +34 935944700 Ext. 1227 per qualsevol dubte o aclariment que precisí.

Li agraïm sincerament la seva col·laboració i predisposició.
Rebi una cordial salutació.

Santí Fort,

*Llei Orgànica 3/2018, de 5 de desembre, de Protecció de Dades Personals i Garantia dels Drets Digitals

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Generalitat de Catalunya
Consorci per a la Formació Continua de Catalunya



Desenvolupat per
eurecat
academy

Motivació



En primer lloc coneixereu alguns dels nostres professors i us plantejaran alguns dels seus problemes. Segurament alguns d'ells son familiars i us faran reflexionar.

CONTINUAR

Training for the tourism sector (for the Catalan Government)

Generador de Catalunya
Departament d'Empresa
i Coneixement

#formacióturismecat

Insicua-Itel
eurecat
academy

Benvinguts al curs

Formació Turisme

La Direcció General de Turisme (DGT) i l'Agència Catalana de Turisme (ACT) organitzen conjuntament un nou programa de cursos formatius: #formacióturismecat.

Els meus cursos

La gamificació com a estratègia d'innovació en turisme. 2ª edició

Parlant: Maria López Costa

- Data: 15/05/2020 (10h a 14h)

Com fer fotos i vídeos turístics de qualitat per vendre millor el teu negoci. 2ª edició

Parlant: Enric Guillen

- Data: 19/05/2020 (10h a 14h)

Tecnologies digitals per millorar l'experiència dels meus clients. 2ª edició

Parlant: Roger Farsaco

- Data: 20/05/2020 (10h a 14h)

Fes accessible el teu establiment. 2ª edició

Parlant: Mònica Molina

- Data: 21/05/2020 (10h a 14h)

Digit-T (Advanced manufacturing training)

<https://training.digit-t.eu>

Digit-T
DIGITAL MANUFACTURING TRAINING

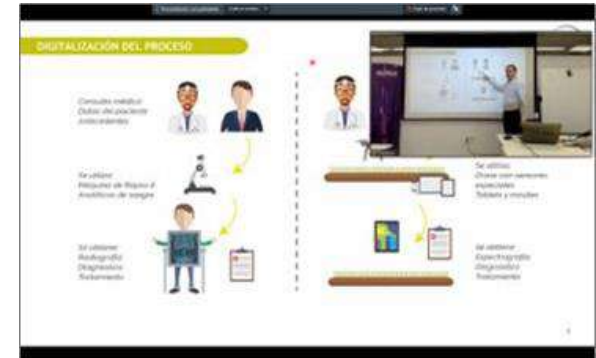
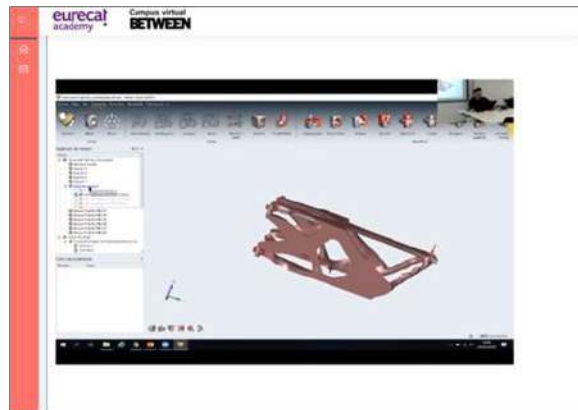
Digit-T
DIGITAL MANUFACTURING TRAINING

The Digit-T platform will offer a coherent training system to provide an overview of Digital Manufacturing relying on the latest developments of computer science (CS), information and communication technologies (ICT), and manufacturing science and technology (MST).

EN ES IT

STIIMA University of Nottingham UK | CHINA | MALAYSIA eurecat AFIL With the support of the European programme of the European Union

Between



Many other e-learning projects for different sectors with different approaches

- OBS (Olympic Broadcasting Services)
- Tecnomifood
- Barcelona Turisme
- Login.cat
- Between
- IT Academy by Barcelona Activa

References

1. Nandi, A., Xhafa, F., Subirats, L., Fort, S. A Survey on Multimodal Data Stream Mining for e-Learner's Emotion Recognition. IEEE COINS 2020 . Barcelona, Spain. In press.
2. Gallego, T. G., de la Rubia, M., Hincz, K., Lopez, M. C., Subirats, L., Fort, S., Sacha, G.M. Influence of COVID-19 confinement in students' performance in higher education. Edarxiv.
3. Subirats, L., Pérez, L., Hernández, C., Fort, S., Sacha, G.M. A granularity-based intelligent tutoring system for Zooarchaeology. Journal of Applied Sciences, 9, 4960, 2019.
4. Subirats, L., Fort, S., Hernández, C., Pérez, L., Vesisenaho, M., Nousiainen, T., Peltonen, M., Miakush, I., G.M. Sacha. Intelligent Tutoring System in Archaeology. Proceedings of EdMedia + Innovate Learning, pp. 745-750, 24-28th June Amsterdam, Netherlands: Association for the Advancement of Computing in Education (AACE).
5. Subirats, L., Fort, S., Martín, A., Huion, P., Peltonen, M., Nousiainen, T., Miakush, I., Vesisenaho, M., G.M. Sacha. Adaptive techniques in e-Learning for transnational programs. Seventh International Conference on Technological Ecosystems for Enhancing Multiculturality (TEEM 2019), pp. 879-884. León, Spain.

Thank you

