DESCI

2nd DESCI TESTING PHASE REPORT

This document has the goal to report the main aspects emerged during the 1st *testing phase (academic course 2016-2017). Each school must to fill in a report for each alternating training scenario realized. Your information will be valuable both for the reporting to the National Agency and to better know the experiences realized in each school.*

Overall section

Indicate the course of studies and the curricula involved in the alternating training experience (School itinerary, grades and age of student involved in the alternating training project)

2nd year students of Electricity and Electronics & 2nd year students of Informatics Systems

Indicate the partner/s formally involved in the alternating training experience (enterprises, social actors etc)

- Tecuni (Vinci Group): USER, member of the Living Lab.
- Hetel (Association of non profit VET Schools of the Basque Country). Stakeholder.
- Tknika (Center for Research and applied innovation in VET of the Basque Country, Basque Regional Government) Stakeholder.

VET Schools of the network of the Church (Elizbarrutiko Ikastetxeak) Stakeholder

Describe the scenario and target competences

During the whole school year 2017-2018 students developed a project in order to answer a specific real problem of the company Tecuni.

The scenario consists on developing an artificial intelligence system's prototype for controlling the external illumination of a Smart City. The system is in charge of recording information from different parameters that could influence in the illumination control profiles generating a more adequate curve for each situation achieving a comfort state and a good energetic efficiency. This system enables the modification of the illumination profiles adapting them to each moment's necessities, modifying the illumination curve on a daily basis.

The students were separated in different groups (with 5 members each and mixing students from the two different cycles) and each group had to create a prototype and a theoretical paper that answered the problem that the company asked them to solve. The best project was selected and 5 students developed the project in real settings at Tecuni during a 3 month traineeship.

Describe the kind of Living Lab activated (dates, functions, objectives and targets, results?)

It lasted an academic year (from September 2017 to June 2018)

The Living Lab in Somorrostro activates the project and is composed of 2 teachers, one head teacher, the External Relations Manager, the EU project manager and 2 representatives of an industrial company in the electricity management sector.

The Living Lab has presented a real problem that needs to be solved in order to improve the services provided to the municipalities: the need to anticipate failures in the electricity grid of a city/town, through a simulator or an early failure detection system.

- Students in their 2º year of Higher VET Informatics Systems
- Students in their 2º year of Higher VET Electrotechnical and Automated Systems

The living lab considered that putting together students from 2 different cycles, will provide an added value to the outcomes and will enrich the acquisition of knowledge and transversal skills such as team work, leadership or decision making.

Objectives:

- Divergent thinking
- Initiative
- Leadership

- Responsibility
- Autonomous learning
- Research skills
- Ability to get questions by examining data
- Learn to understand
- Team working
- Conflict resolution
- Communication
- Team awareness

Plus the technical skills included in the rubric matrix that are those mandatory in order to accomplish the course.

Describe the connections with the local community

This project has have an impact not only on the students participating in the Scenario, but also in the rest of the VET students of our school which have been told about what their mates were carrying out, and because the final product that has been developed will help future students on their learning processes.

Apart from that, the families of the students have also been connected to the project in a way, as they have been part of the project since they have been informed every time of what their children were doing.

In addition, the project has also reached other VET centers of the Basque Country thanks to the meetings with different associations such as HETEL (Association of the social initiative VET centers of the Basque Country) or TKNIKA (Research and innovation center applied to the VET centers of the Basque Country) to whom we inform of all the different projects we carry out and share them among the rest of the centers of the country.

Finally, the most important connection may be the one related to the workers of TECUNI, but not only those who have had an active role in the project, but also the rest of them. TECUNI will use the prototype our students have developed as a tool for training their workers and also as a way of improving their grid service.

Apart from those connections mentioned above, it can also be mentioned the importance of the enterprise with which we have worked during this project on the Basque Country:

TECUNI is one of the best known enterprises in the grid field in Basque and national level. They are well known for the creation and managing of intelligent and last generation electrical grids. Right now they are working on the managing of this kind of grids in Bilbao, one of the most important cities in Spain. The

project our students have developed will help this enterprise on their work within carrying the innovation to the Basque Country.

Indicate the participatory practices activated

- Participation of 37 students, from different specialties working together during 5 months and a half
- During 3 months 5 students carried out the project assembling all the equipment in TECUNI
- Brainstorming
- Metaplan (Analysis of what the enterprise needs and the design of a proposal which fulfills those needs)
- Flipped classrooms (two different VET levels involved)

As mentioned in the report this project was presented as a challenge to the students. After several meetings between the enterprise and the school and once the basis of this challenge were defined, the enterprise went to the school and presented the challenge in front of the students.

The first phase of the project began with 37 students, with from two different specialties working in groups and preparing a project that would answer that challenge presented by the enterprise. This period lasted 5 months and a half and was carried out in the school, where the students were tutored by the teachers and by technicians of the company so that they could guide the different groups on the right direction. The enterprise asked for solutions and innovation for the challenge presented, something that was taken into account at the time of deciding which group was the one presenting the best project.

Once the different groups had presented their different projects, a committee formed by teachers from the school and representatives of the company decided which of the projects presented was the one which better fulfilled the needs of the challenge. The winner group has had the chance of developing the project they presented in the company in the enterprise.

Design Phase

Describe the activites developed in the Design phase (stakeholders involved, number of meetings, positive and critical aspects etc)

The designing phase of the challenge that later was going to be presented to the students took 2 months in which teachers from our school and representatives of TECUNI, the partner company, were working hand in hand for the development and adjustment of the challenge. As the challenge presented to the students had to fulfill the curricula requirements of the Basque Government, there were the teachers and the company representatives, and not the students, the ones that developed the designing of the scenario.

At the beginning there were 5 meetings in which representatives of the school and the director and technicians of the company decided which the basis of the challenge were going to be, and adapted and selected among the different necessities of the company the one that may be more accurate to the field the students were studying. This necessity was later discussed and adapted to the requirements of the Basque Government as it has later to be evaluated and qualified under their rules.

After these meetings both the teachers from Somorrostro and the technicians from TECUNI involved in the design of the challenge presented it to the students from our school, asking them that, under the basis decided in the previous meetings, they had to create in mixed teams a project which could gave a solution to that necessity, always trying to present something innovative.

Who defines the alternating training program of the student? If possible, give further information about the role of each part in defining the alternating training program of each student

Both technicians of the company and the teachers. The technicians present different ideas of what they would like to develop and the teacher adequate these challenges to the learning results and the different necessities of the education curriculum.

Implementation phase

Please, describe the activities developed in the Implementation phase (specify how much time in the school and how much time in the enterprise/ describe the role of teachers and enterprises in the development of students' alternating training)

The implementation phase can be divided in two different phases:

On the one hand, once all the students were informed about the challenge TECUNI was asking them to solve, they had to create a project which could give an answer to the necessities of the company. The 37 students worked in their projects at school from September 2017 to February 2016. During these months of preparation the students always had the help of the teachers so that they could act as guides when a problem may arise, and also arranged meetings with technicians from the company in order to get first-hand information of what they were seeking for.

In February all the groups had to present their project in front of a committee formed by representatives of both the school and the company. After seeing and studying all the projects the committee chose the one which better respond to the companies necessities taking into account that it presented an innovative way of doing it.

On the other hand, the second phase of the implementation started when the group selected as the winner started to develop what they presented in their project. The winner group was formed by 5 students.

The implementation phase lasted from March 2018 to June 2018, and the students developed a prototype of what they presented in their project in the company. These months counted as internships for them. During these months they had the constant help from teachers and technicians from the company which were always in contact one with the others. The teachers had the role of helping them with any problem and guiding them so that there was no a deviation of the objectives that were accorded with the enterprise in the designing phase. As mentioned above, there was a constant tutoring of the teachers. Due to the closeness of the company to the school (8 km), the teachers and representatives of the school were able to have several meetings during this phase to analyse how the work of the students was going.

Evaluation phase

Please, describe activities developed in the Evaluation phase and specify who is responsible for student evaluation during alternating training?

    A. The teachers
    B. School entities (please specify):_____
    C. The government
    D. The enterprise
    E. Both school entities and enterprises
    F. A mixed system that also includes other stakeholders

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The evaluation is carried out both by the enterprise and the teachers, however, t, as the Basque Governments demands, the last responsible of evaluating the job the students have done is the teacher

Evaluation Framework

Results of the Focus groups of the Evaluation Framework (to be filled in for each focus group realized)

Please describe, in a synthetic way, background and issues addressed during the Focus Groups and include the input provided by the participants.

Date: 04/05/2018

Venue: Centro de Formación Somorrostro

Participants: 8

NAME OF TUTORS /TEACHERS /MODERATORS	ORGANISATION	EMAIL
Tamara Yagüe (General Director)	TECUNI	Tamara.yague@tecuni.com
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Please describe, in a synthetic way, background and issues addressed during the Focus Groups and include the input provided by the participants.

STRENGTHS:
1- **Students:**
   a. Transversality: Students have gained transversal competences which will be basic for the future jobs as nowadays employers are looking for skills such as attitude, teamwork, decision making, and so on more than technique knowledge
   b. The students, instead of getting as much theory as in other modules, learn how to face day to day life experiences (deal with providers, problems with the customers,…)
   c. The students from the informatics module have had the chance to have a more open-minded view of their possible future thanks to this scenario and the opportunity of seeing how their job could be 100% related to the Industry 4.0
2- **Teachers:**
   a. Working the way is stated in the DESCI project means a bigger effort, but the reward is more than worth it
   b. They have had the chance to investigate and to acquire new knowledge in the working field when preparing the scenario and working with the students
3- **Tutors/Company:**
   a. Better relations with the social environment
   b. They train in first hand their future workers (6 students of last years' scenario are working in the company right now)
   c. Interchange knowledge with the students and trainers from the center involved in the scenario
   d. They are able to investigate/experiment in real life situations

WEAKNESSES:
1- **Students:**
   a. Some frictions among the same team students- but this becomes into a value as they finally learn how to work as a team
   b. At the beginning they show a little reticent as there is a new way or working/being trained that they are not used to
   c. Once they start working on the project, some of them forget about the rest of the subjects, and their learning achievement sometimes goes down
      i. In the electricity and electronics cycles the students work all the modules through the DESCI method, while in the informatics cycle, just one of the modules, making this that students sometimes forget about the rest of the subjects
2- **Teachers:**
   a. All the modules of the cycles should be teach following the DESCI method, not just one subject, as, if not, some teachers have to modify their lessons and there is some theoretical matters that cannot be seen by the students due to the lack of time.

3- **Tutors:**
  a. Nothing to declare. They are very happy and satisfied with the whole process

PROBLEMS ARISE DURING THE 2017/2018 SCENARIO:
The only problem to underline was with one of the providers of the materials needed by the students for creating their "pilots" before showing them to the steering group of Tecuni. The company has had a long time relation with the providers, but watching how they "behaved" in relation with the scenario, they realized about some problems and decided that they were no longer going to work with them. At the end, the problem was a way of getting to realize how they wanted their providers to behave and be in order to keep on evolving for the future.

DIFFICULTIES ARISE DURING THE 2017/2018 SCENARIO:
The teachers and tutors during the preparation of the last year and this year's scenarios have find a little bit difficult to adapt the curriculum and learning outcomes that the students have to fulfill to a scenario/challenge. Some of the things the students learn during the time they are working in groups are not even part of the curriculum, so they have the chance to learn more things than they are expected, which is a very good point. However, in the same line, some of the theoretical aspects that they have to work in but that are not part of the scenario cannot be totally fulfilled due to the lack of time.
On the other hand, one of the students participating in this year's scenario has Asperger Syndrome, which gives him difficulties in terms of social abilities. The teacher, seeing his great capacity when it comes to the studies – he is a very good student- decided to "name" him the leader of one of the teams. Due to his special needs he had struggles to fulfill that role in the team. Summing up, when facing students with special needs, it is important to adapt the DESCI working method to their capacities.

TRANSVERSAL SKILLS THAT THE STUDENTS AQUIRE THANKS TO THIS WAY OF WORKING:
The DESCI approach, apart from giving the students the opportunity of getting hands on experience in day to day life situations and a direct contact with enterprises in which they may work in a future, give them also the chance to acquire new transversal skills that may be very important for their working future. Nowadays the recruiters are looking for versatile employees with a great variety of soft skills. Thanks to this experience the students have been able to acquire the following competences:
  - Teamwork abilities
  - Oral communication abilities
  - Spoken presentation abilities
  - Decision making abilities
  - Leadership abilities
  - Entrepreneurship
  - Commitment
  - Respect to their team mates

The students have been able to find their place inside the group and have learnt how to work together. The experience of working in teams has given the chance to the students to better know themselves. During the process of working in groups the students themselves are surprised of their capacity of working with others and how easy they have been able to adapt themselves to it.
TOOLKITS:
Both, the students and teachers have expressed that, even all the information of the toolkit is very useful

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when facing the scenarios; they are a little bit "harsh" to read due to their length. Teachers stated that the toolkits should be a little more appealing to get the students attention.

However, the teachers, before starting the new scenarios, create a document based in the toolkits and with additional information such as the evaluation framework and all the information regarding the scenario that is based in the toolkits. The student receive the toolkit and this document at the same time, but, as they have stated sometimes, they relay more in the document created by the teachers as they have more clear information on it.

FUTURE:

Teachers and tutors of the company are already working in next year's new scenario. Even though the DESCI project will come to an end, both parts have shown their will to continue working this way.

One of the novelties for next year is that the company wants to name one tutor per students group. Until now there were 6 tutors of the company that worked with different group of students, but, starting next year, each group will have its own tutor to whom they will be able to send emails with doubts and have meetings more often. Tecuni's director stated that they want to have a clear vision of what the students are working on and to offer them as much help as possible.

On the other hand, TECUNI, as part of the multinational Vinci Group, exposed this experience to the rest of companies of the group, and they have named it as a good practice. They want to spread this way of having a contact relation with schools and students all over their enterprises. A month ago they filmed different images and interviews with students and teachers on how this methodology worked, and they want to spread it among different stakeholders and companies. (Once the video is ready and they send it to us we will share it with the consortium)

Suggestions for the Toolkits improvement

Please indicate, for each toolkit (teacher toolkit, student toolkit and evaluation toolkit) the critical issues emerged during the testing phase and give a specific input to overcoming it.

After all the changes and improvement the toolkits have gone through, we believe that the toolkits give an answer to what the consortium was looking for with the development of this project, and that all the improvements and queries have already been solved.

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