COLIBRI MODULE O17:
Documentation of project results (Year 2)
Preliminary report

This material is developed as a part of the Erasmus+ Strategic Partnership Colibri: Collaboration and Innovation for Better, Personalized and IT-Supported Teaching.

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You can learn more about the Colibri project on www.erasmus-colibri.eu, and also find additional teaching materials, guidelines and reports.
COLIBRI

Collaboration and Innovation for Better, Personalized and IT-Supported Teaching.

Year 2 report

Erasmus+ Strategic Partnership
Colibri consortium

Academic partners:
1. Aalborg University (AAU)
2. Bogazici University (BOG)
3. Riga Technical University (RTU)
4. UTP University of Science and Technology in Bydgoszcz
5. Universitat Politècnica de Catalunya · BarcelonaTech (UPC)
6. Hamburg University of Technology (TUHH)
7. University of Stavanger (UIS)

Industrial Partners:
8. National Documentation Centre (EKT/NHRF)
9. Talaia Networks S.L.
10. atene KOM GmbH
Colibri vision

We experience: Increase on the number of students

The challenge: Student diversity

Cultural Background
Learning styles

We need: Personalised teaching + new and innovative teaching methods

We want: Students ready for the labor market + collaborate across nationalities, cultures, and technical disciplines.

By: Institutions working and experimenting on joint learning activities
Background experiences of the consortium

• The involved organizations all have different experiences with new teaching methods, and the staff involved are generally involved in this – and curious. We are sure we can learn from each other.

• Four of the universities in the past were running a successful Erasmus Intensive Programme (summer school), where the students also both followed courses and did projects together.
Colibri overall objectives

Enhancing the **quality and relevance** of the learning offer in education by
developing new and innovative approaches, and by supporting the dissemination of best practices

Promote the **take-up of innovative practices** in education by
supporting **personalized learning approaches**, **collaborative learning**, by making **use of ICT** and **Open Educational Resources**, and by **exploring the use of blended and virtual mobility**

Increase **labour market relevance** of learning provision and qualifications
Important:
It is a goal of Colibri to not only impact the participating teachers and students, but to have a system and lasting impact – within the involved institutions, but also beyond.

- Implementation of new and innovative teaching as joint learning activities.
- Establishment of a “Living Lab” of students from different universities.
- Topic/Theme: Future Internet Opportunities, with participation of students from e.g. business, engineering, entrepreneurship, telecommunications, computer science.
Overview of project concept

3 yearly cycles

- **July-August:** Evaluations, Ambassador activities, Documentation
- **July:** Project seminar, Transnat meeting
- **April - July:** Virtual mobility (project)
- **March-April:** Virtual kick-off
- **March:** Virtual mobility (course)
- **April:** Midway seminar
- **October:** Short Staff training
- **September:** Transnat meeting
- **Evaluation + Dissemination**
- **Preparation**
- **Development**
- **Teaching**
The Colibri course structure (2016)

- **Module work**: Virtual Kick-off February 16
- **Project work - virtual collaboration**: Midway Seminar April 18-22
- **At least 3 supervisor meetings**
- **July 15: Exam**
The course modules offered

• Depending on his background and interests, each student:
  • Follows all 10 introductory modules (1 hours of work)
  • Chooses 4 basic modules to follow (5 hours of work)
  • Chooses 2 advanced modules to follow (10 hours of work)

• 10 different topics are offered (each at intro, basic, advanced levels):
  • Advances in information systems,
  • Nanonetworking and molecular communications
  • Future Internet Architecture
  • Applications and services
  • Advances in wireless communication technologies
  • Machine-to-Machine communication
  • Advances in broadband technologies
  • Network Security
  • Enterprise architecture
  • Entrepreneurship and Corporate entrepreneurship
The course modules offered

10 introductory
- Intro module 1 (1 hour)
- Intro module 2 (1 hour)
- Intro module 9 (1 hour)
- Intro module 10 (1 hour)

Select 4 basic
- Basic (5 hours)
- Basic (5 hours)
- Basic (5 hours)
- Basic (5 hours)

Select 2 advanced
- Advanced (10 hours)
- Advanced (10 hours)
The teaching methods

- **Personalization** by pre-module tests and providing (or linking to) preliminary teaching material.
- **Experiment** with new ways of conducting the courses and projects
- **Short video lectures**
- **Small assignments**
- **Mini projects**
- **Company proposed projects** to work in groups

**Teacher training seminars**

Forum for inspiration lectures, presentations, peer discussions, and time for creating and revising teaching material with the possibility to discuss with colleagues, and give feedback on each others approaches.
Expected outputs

• Focus is on **systemic impact** and **long-term results**. They key is to (1) make the material easy for others to use, and (2) to spread the word about the project to university teachers.

• Teaching material that can be **re-used and exploited by others**. Made publicly available as Open Educational Resources. Packed together with descriptions, instructions, evaluations for easy take-up by others.

• Reports, but also more practical and hands-on inspiration material for **different target groups**.

• Spread the word: **Colibri Ambassadors**.
The teaching methods (courses)

• We will experiment with new ways of conducting the courses and projects throughout the project. So, the teaching methods chosen for the second year will be chosen based on our experiences from the first year.

• The second year, the modules were mainly based on
  • **Clear instructions and clearly marked “endings”** of each module levels. Progression tracking to ensure overview of tasks and status.
  • **Self-assessment and preliminary material** (basic modules)
  • **Short videos**, interchanged with **quizes** to keep students active.
  • **Literature and assignments**, with well defined scopes.
  • **Q&A Forums**
  • **Peer-learning** (only in advanced modules) – important that tasks, interactions, deadlines etc. are clearly defined.

• The groups were formed from the beginning of the course, and the students in each group coordinated their choice of modules to ensure broad coverage.
**Introductory module (1 hour workload)**

- Overview lecture (max. 2 videos of max. 10 min.)
- Individual task or assignment
- Individual task or assignment + peer review
- Peer learning in project groups
- Optional literature/material
Examples of introductory module (1 hour workload)

- Study learning objectives
- Literature: For example an introduction or case study
- Video
- Quiz
- Video
- Quiz
- Video
- Quiz
- Final quiz
Basic module (5 hour workload)

- 10 min. self-assessment (+ preliminary material)
- 60-120 min. literature study
- Video lectures with shorter tasks (max. 10 min. lecture/5-10 min. self-correcting questions/ working with tools) (120-180 min.) max 50% of video lectures.
- Self-correcting quizzes and assignments. Quizzes follow a common template.
- Practical exercises to work with the relevant tools
- Q&A forum
Example of basic module (5 hour workload)

- Study learning objectives
- Premodule test
  - Premodule materials (based on test results)
  - Video
  - Quiz
- Video
- Quiz
- Video
- Quiz
  - Video
- Quiz
- Practical exercise
- Final quiz

Q&A Forum for discussions and questions available throughout the duration of the module
Advanced module (5 hour workload)

- Literature reading
- Video lectures (max. 10 min. lecture)
- Group assignments (in 2-4 people groups)
- Peer assessment workshops: Assignment + peer assessment (students assessing students)
- Article assignment: Reading, discussion, presentation of work in relation to an article
- Additional material in the form of videos, books, scientific papers, PPTs…
- Quizzes

Additionally, the students will be involved in a variety of activities during the physical seminars focusing on presentations such as:
- Pitch talks in front of their peers
- Interactive lectures about presentations and slide deck preparation
- Videos addressing issues in professional communication
Example of advanced module (10 hour workload)

- Study learning objectives
- Video
- Quiz
- Scientific articles for reading
- Group exercise
- Assignment
- Review assignments from other students
- Read articles, and prepare presentation
- Final quiz

Q&A Forum for discussions and questions available throughout the duration of the module
The teaching methods (projects)

- We will experiment with new ways of conducting the courses and projects throughout the project. So, the teaching methods chosen for the second year will be chosen based on our experiences from the first year.

- Real-world problems proposed by companies
- 8 groups – each with 3-4 students from different universities.
- One academic supervisor and one company contact per group.
- Clear learning objectives.
- Starts in midway seminar, ends in project seminar – virtual collaboration in between.
- Supported by introduction to problem based project work and collaboration in the midway seminar and introduction to collaboration tools.
- The project work is self-organized, but we support it through requirements for minutes and structured reporting to supervisors. The students are required to setup milestones and report accordingly.
The teaching methods (projects)
The flow of the project work

**Midway Seminar (April)**
- Monday: Finish modules
- Tuesday: Team work and presentation skills
- Wednesday: Workshop on Future Internet Business and Innovation
- Thursday: Announcement of projects and work on Problem Analysis
- Friday: Continue project work. Plan the virtual phase

**Virtual collaboration phase (April-July)**
- Students work independently
- At least 3 supervisor meetings
- Support from university supervisor
- Support from company contact
- Access to all modules
- Access to relevant collaboration tools

**Project seminar (July)**
- Monday: Presentations and feedback from peers/companies
- Tuesday: Group work + presentation skills
- Wednesday: Guest lecture + excursion + group work
- Thursday: Finalising presentation + video training of presentation
- Friday: Presentations and exams
Module content is available as just-in-time resources

Problem Analysis
Learn about the problem domain

Continue with the project work, identify new problems to be solved ...

Identify problem when working on the project → Identify relevant tools/methods → Learn through just-in-time resources → Apply new knowledge to solve problem
**Blended mobility (I)**

- **February 16:** Virtual Kick-off
- **March 28 - April 16:** Peer assignments
- **April 4:** Intro+basic modules deadline
- **April 16:** Advanced module deadlines
- **April 18-22:** Midway Seminar
- **At least 3 supervisor meetings**
- **July 11-15:** Project Seminar
- **July 4:** Upload preliminary presentations
- **July 15:** Exam
**Blended mobility (II)**

- The yearly learning activity is introduced to the students in a [virtual kick-off seminar](#) during February. The students are introduced to the overall learning objectives, topics, teaching methods, and quality control measurements.

- This is followed by a [phase of virtual learning](#) (the course modules).

- **The midway seminar** is the first physical mobility, and takes place in April. Here, students and teachers meet for five days in order:
  - Let students (and teachers) get to know each other, and work on methods for problem solving and group work.
  - Finalize the courses, with student presentations
  - Introduce the projects and supervisors. Having the groups working together towards a project plan, and initial problem analysis.
  - Focus on connection between course modules and projects, as well as on supporting the team work.
Virtual kick-off: Getting to know each other
Module work (virtual)

Quiz with immediate feedback

Video lecture
Midway seminar: Start working on problems
**Blended mobility (III)**

- The midway seminar is followed by a **phase of virtual collaboration** in the groups. The groups and supervisors will have a large degree of freedom on how to work together, and what tools to use – but objectives/milestones should be clear. More structured than in year 1, without losing the self-organization.

- **The project seminar** is the second (and last) physical mobility. Here students are working together in order to finalize the projects, and for presentation/examination. Also, the project seminar will be used to receive feedback from students regarding all aspects of the learning activity (evaluation).
Project work: Virtual collaboration
Project seminar: Finishing projects
Project seminar: Presentations and exams

- The results of the survey
- A series of recommendations to consider regarding privacy
- Final recommendations to find the sweet spot in the privacy continuum
Content of the learning activities (projects)

• The student projects are based on **real-world problems/cases**, and defined by the industrial partners in the program, with the possibility that other companies may also participate with proposals. EKT/NHRF will also propose projects, where the starting point will be a start-up company with a specific market idea.

• The projects will **require the students to work together, and make use of both technical and business-oriented competences**. The project analyses a specific problem, and selects appropriate tools/methods to design and verify one or more possible solutions.

• **The project must ensure that the learning objectives of the learning activity is supported** (key words: Skills in exploring the opportunities in Future Internet, by relating technical, social and business aspects, demonstrating these skills in one or more real-case scenarios. Competences in working together in teams across scientific areas, countries and cultures, and being able to bring into play the students own knowledge in the teamwork).
Project example: Bike sharing platform

- Pedelecs seem to be a suitable substitute for other vehicles. However it is essential to increase the attractiveness for this way of transport compared to traveling by car, for example by developing an interconnected system easy to use (applications, interactive elements etc.). The task is focused on describing how to develop such system going from the high level technical aspects of the solution to a feasible business plan for a Pedelec-Sharing-Platform.

- Pedelec sharing is environmentally responsible and leads to sustainable improvements of urban mobility.

- A Station-based system meets the trade-off between flexibility and cost-efficiency

- Easy to use, quick, flexible and connected to meet customer demands
Tools and platforms used (1)

- Moodle as learning platform.
  - Acceptable for courses and allows for interactive content.
  - Improved with completion tracking and a complete reorganization: Students only see the parts they actually follow. Much better 😊
  - Also implementatation of the course was done differently, so it was completely clear what tasks to do, and how to carry them out.
  - Assignments and workshops used more intensively.
  - Still need for improving user experience and design.
  - Allows for guest access (but with limited functionality)
  - Not suitable for project work -> alternative platforms needed.
- Facebook for general communication
  - Everyone uses it
  - Good for all platforms
  - Facebook was improved since last year, with better possibilities for organising document storage etc. (but still tends to become messy).
Tools and platforms used

- Adobe Connect and Skype for meetings
  - Sometimes they work well. But not for many participants at the same time.
- Youtube for videos
  - Works well all on platforms.
  - Publicly accessible
  - Does not allow for interactive content
  - Alternative platforms was tested, but none deliver the flexibility of Youtube – it is a big advantage that it runs on all platforms and devices.
- For group work different platforms were used and evaluated (see separate survey): Google hangouts, Big Blue Button, Skype, Adobe Connect. However, none of the platforms really support all relevant aspects of project work.
- For group work it is a challenge that file sharing, communication, meetings, chats, etc. is done in different platforms.
The Colibri Ambassadors

• All staff who at some point has been involved in Colibri becomes Colibri Ambassadors.

• These are the people who “spread the word” both inside and outside our organizations. We use this to get in touch with a large number of university teachers (and we keep track of how many).

• We make sure that the Colibri Ambassadors are ready to take on the role: They get to know the project well, and we keep them informed about progress and results (both through our Facebook group and by yearly meetings in each organization).
Results from the first two years

• Based on surveys to all students, teachers and company representatives

• Feedback during midway seminars and final seminar

• Detailed statistics on www.erasmus-colibri.eu (evaluation of all modules and projects).
**Students:** To what extent do the teaching methods used in Colibri increase the quality of the learning offer?
**Students:** To what extent do the teaching methods used in Colibri increase the relevance of the learning offer?
**Students:** To what extent do the teaching methods used in Colibri increase the labor market relevance of learning provisions and qualifications?
**Students:** Personal outcome: To what extent do you think the teaching methods used in Colibri will help you in your further studies?
**Students:** Personal outcome: To what extent do you think the teaching methods used in Colibri will make you better prepared for the national labor market?
**Students:** Personal outcome: To what extent do you think the teaching methods used in Colibri will make you better prepared for the international labor market?
**Teachers:** To what extent do the teaching methods used in Colibri increase the quality of the learning offer?

![Graph showing the extent of teaching methods used in Colibri over two years.](image-url)
**Teachers:** To what extent do the teaching methods used in Colibri increase the relevance of the learning offer?
Teachers: To what extent do the teaching methods used in Colibri increase the labor market relevance of learning provisions and qualifications?
**Companies:** To what extent do the teaching methods used in Colibri increase the quality of the learning offer?
Companies: To what extent do the teaching methods used in Colibri increase the relevance of the learning offer?
**Companies:** To what extent do the teaching methods used in Colibri increase the labor market relevance of learning provisions and qualifications?
Dissemination and impact from first two years of Colibri

• Numbers are from 2nd year, with first years numbers in parenthesis.

• Tangible and intangible results of Colibri has been used in 35 (28) courses/learning activities. A total of 860 (583) students have benefited from this.

• 129(74) colleagues in the local teaching environments have been inspired by the use of Colibri, from which 1288 (325) students have benefited.
Take away messages from the first two years

• Based on both comments and qualitative evaluations, it is clear that the international, cross-disciplinary and problem based approach is highly valued. This is by many of the participants seen as the most valuable aspect of Colibri. Thus, it is especially the improved horizontal competences that are seen as benefiting from the project.

• This is also confirmed in the rating of personal outcome, where the students are particularly happy about the improvement of their preparedness for the international labor market.
Take away messages from the first two years

- The course was generally **well received** by the students – especially when they got to work in international groups on real-world problems.

- The modules generally worked well, and was improved significantly in the 2\textsuperscript{nd} year. In particular, the expectations and activities were much more clearly formulated, and the amount of communication between students reduced to two advanced (but larger) modules.

- **Progression tracking**, more **individualized setups** (students could only see the modules they chose), **clear formulations of tasks**, and **clear conditions for finalizing each module** helped improve the students experience.
Take away messages from the first two years

• Peer learning is a good idea, but need clear instructions and guidelines (e.g. it is hard to self-organize).

• The virtual collaboration between the seminars worked better in the second year than in the first year – early formation of groups and more focus on team work processes in the first seminar helped for this. But we still need to help the students structure the process even more…

• Video/presentation training during midway seminar was well received in both first and second years.

• Even if we managed to create good relationships between modules and projects, it is important also to demonstrate these clearly for the students. That is something to work on in the last year of the project.
Focus points for third year

• Improving peer learning.

• Improve the relationship between modules and projects (and/or make the relationship more visible for the students).

• Improve the individual learning paths.