Periodical Report
24 Months of project implementation

New Curricula in Precision Agriculture Using GIS Technologies and Sensing Data

University of Oran1 Ahmed Ben Bella
Fac. Life/Nature Sciences / Fac. App/Exact Sciences

Co-funded by the Erasmus+ Programme of the European Union

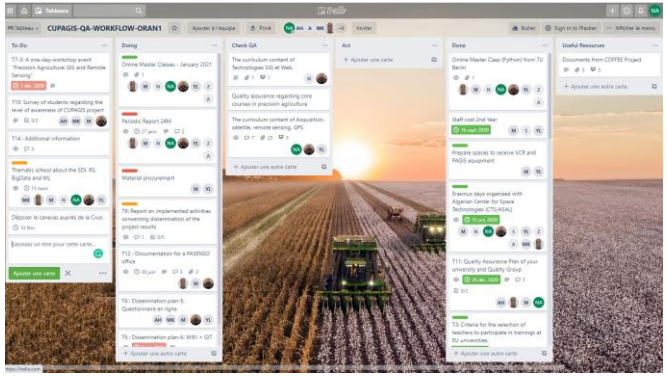
Joint Project: Capacity Building in the Field of Higher Education ERASMUS+ 2018

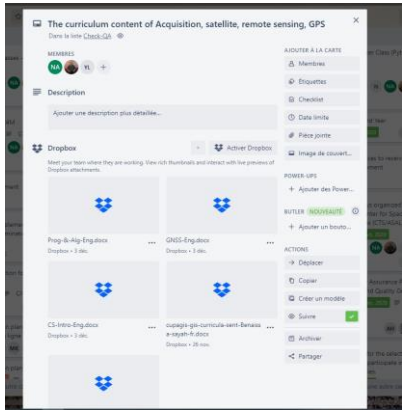
Project activities: Development

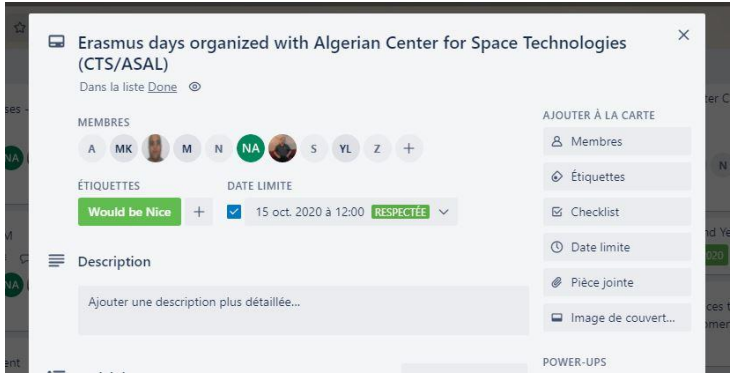
- Regional accreditation of Oran1 curricula Bachelor on Precision Agriculture
- Update the current Oran1 curricula offer in Precision Agriculture, in response to the EU peer reviews
- Setting Equipment list for precision agriculture curricula
- Setting criteria for the participants of the online master classes
- Prepare spaces to receive VCR, PAGIS and PASENSO equipment

Project activities: Quality plan

- Trello software (https://trello.com) to manage project tasks







- Ensure peer reviews for the whole bachelor curricula on Precision Agriculture, especially technologies courses

Project activities: Dissemination and exploitation (1/3)

Conference organized with Algerian Centre for Space Technologies (CTS/ASAL) - 15/10/2020

Talks ensured by experts from the Algerian Centre for Space Technologies on the following subjects:

- remote sensing,
- agricultural inventory,
- estimation of areas and yields by use of GIS,
- GIS for sustainable development, SDI.

A planned cooperation with Algerian Center for Space Technologies to organize an online event/content on Remote Sensing and GIS for Precision Agriculture.

Project activities: Dissemination and exploitation (2/3)

Conference organized with Algerian Centre for Space Technologies (CTS/ASAL) - 15/10/2020

Project activities: Dissemination and exploitation (3/3)

Conference organized with Algerian Centre for Space Technologies (CTS/ASAL) - 15/10/2020

Project activities: Management (1/3)

We conducted numerous distant zoom meetings:

- Oran1 local meetings
- National meetings
- All partners meetings

26/11/2019 - Oran 1 local meeting: Finalization of the curricula.
05/12/2019 – All partners meeting: Discussion on the coming deliverables of the project.
13/12/2019 – All partners meeting: Quality assurance.
08/02/2020 – National meeting: VCR equipment, number of teachers for Plovdiv and CUL trainings.
11/02/2020 - Oran 1 local meeting: Update of the curricula to conform with national regulations.
26/03/2020 – All partners meeting: Future activities in the context of COVID'19 and cancellation of the programmed trainings at AU Plovdiv and CZU Prague.
06/04/2020 – National meeting: Discussion on sensors equipment, first list sent to EU coordination.

Project activities: Management (2/3)

09/04/2020 – All partners meeting: Equipment, first list sent after EU meeting.
19/04/2020 – National meeting: Approve the list sent by Pr Soomere.
19/06/2020 – All partners meeting: Quality report of the external expert Dr. Girenko and future tasks concerning the project.
25/04/2020 - Oran 1 local meeting: Approve the equipment list.
27/06/2020 - Oran 1 local meeting: Discussion on launching the curricula in the context of COVID'19.
27/06/2020 – National meeting: Discussion on proposing our curricula to peer-reviews.
29/06/2020 – All partners meeting: Discuss the academic content of the courses. The peer-review of the developed teaching material is crucial for the development of the courses.
07/07/2020 – National meeting: Erasmus monitoring.
29/07/2020 - Oran 1 local meeting: discussion on the remote sensing equipment and the possibility to get the drones.

Project activities: Management (3/3)

03/08/2020 – All partners meeting: teaching materials, additional equipment sent by Berlin partner.
05/08/2020 – National meeting: Equipment, peer-reviews, importance to address a letter to our ministry of higher education to get the permission for drones acquisition
10/08/2020 – All partners meeting: Discuss peer-reviews with European partners (Plovdiv, CUL).
19/08/2020 – All partners meeting: Equipment approved with drones acquisition.
22/09/2020 – National meeting: Officialise the national coordination to Pr. Kadoun. Discuss the current sensors equipment list.
20/10/2020 – National meeting: Erasmus monitoring.
27/10/2020 – National meeting: Discuss the difficulties to get the drones.
05/11/2020 – National meeting: Set the equipment list without drones acquisition.
11/11/2020 – All partners meeting: Set the equipment list without drones acquisition.

Benefits of implemented activities

- Fruitful collaboration between the faculty of life and nature sciences and the faculty of applied and exact sciences to design the bachelor curricula on precision agriculture.
- Proposition of a research project on using artificial intelligence technologies to enhance cereal farming with the partner UIK Tiaret university.
- Conference organized with Algerian Centre for Space Technologies (CTS/ASAL) enabled a fruitful discussion. An agreement has been signed with (CTS/ASAL).

Updated courses

- **Agriculture**: Plant physiology, Plant biodiversity, Ecology and environment, Physiology of vegetable nutrition, Plant ecophysiology.

- **Technologies**: Introduction to Computer Science, Mathematics, Applied physics, Statistics, Data analytics, Bioinformatics, GIS for Precision Agriculture.

New courses 1/3

- **Agriculture**: Water and water nutrition of plants, Physiology and biochemistry of symbotic fixation of nitrogen, Pedology, Agricultural irrigation technology, Vegetable production, Agricultural mechanization technology, Phytodiagnosis and phytoprotection, Fertilisation, Salty soils.

New courses 2/3

- **Technologies**: Technological tools for Precision Agriculture, Programming and Algorithms, Information systems and web/mobile programming, Image Processing and Computer Vision, Sensor Systems for Precision Agriculture, Remote sensing, Advanced GIS Techniques for Precision Agriculture, Global Navigation Satellite Systems, Artificial intelligence, machine learning and big-data.

New courses 3/3

- **<u>Transversal courses:</u>** Economy, Knowledge of Professions, Fundamentals of the scientific approach, Strengthening of English language skills, Strengthening of language skills for communication, Deepening in the management and creation of companies, Economics of agriculture, Economics of precision agriculture.

Quality assurance: work plan

The quality group is managing quality assurance with Trello software (https://trello.com)

- Quality assurance regarding equipment: Ensure that the VCR room is well appointed, Ensure that the agricultural parcel is well prepared
- Quality assurance regarding core courses in precision agriculture: Monthly reports on the progress of writing manuals/text books/methodological

Quality assurance: peer reviews

- We have launched the peer-review on the core courses
- Focus on the technological aspects of the curricula:
  - Remote sensing for agriculture
  - In situ sensing for agriculture
  - GIS for agriculture
- After the meeting done on 29.06.2020, we got peer reviewers from AU Plovdiv and CZU Prague.
- National peer-reviewers

Laboratory and equipment

- Technologies Modules:
  - VCR and PAGIS equipment
  - Sensors equipment
- Plant biology modules:
  - Laboratory of Plant Physiology
  - Laboratory of Plant Biology
  - Laboratory of Plant Ecology
  - Laboratory of Plant Biochemistry
  - Laboratory of Plant Pathology
  - Laboratory of Pedology

Dissemination (1/2)

Conference

Cooperation with Algerian Centre on Space Technologies (CTS/ASAL)

Dissemination (2/2)

Conference

Cooperation with Algerian Centre on Space Technologies (CTS/ASAL)

Dissemination: Regional cooperation / agreements

- **Agreements with non-academic stakeholders/other members**

  Agreement with Algerian centre for space technologies CTS/ASAL
  Agreement with university Oran2

- **Bilateral agreements between consortium members:**

  One agreement with university UIK Tiaret.
  This agreement was required to propose a new national project on using artificial intelligence techniques for cereal farming.

Pasenso: workplan

- Estalish cooperations/agreements with non-consortium organisations, particularly industrial partners

- Passenso FB page: https://www.facebook.com/Cupagis-Oran1-University-454383688459311

Pasenso: workplan

Actions with Algerian Center for Space Technologies CTS/ASAL:

- Day meeting with CTS researchers
- Organize a joint online event on remote sensing and GIS.

Communication

- Means of communication:
  - **Electronic meetings via Zoom**
  - **Email**
  - **Google drive**
  - **Google sheet**

Conclusion

- Finalization of the bachelor curricula on precision agriculture
- Regional accreditation of the Oran1 curricula Bachelor on Precision Agriculture
- External peer-reviews enabled to enhance the curricula
- Dissemination: conference organised with the cooperation of Algerian Center for Space Technologies CTS/ASAL
- Proposition of a research project on using artificial intelligence technologies to enhance cereal farming with the partner UIK Tiaret university
- Management: zoom meetings enabled to cope with important subjects, such as sensors equipment and external peer-reviews
- Due to COVID19, EU trainings not done. Equipment list not purchased.
- Due to COVID19 uncertainties, we have not launched the new Oran1 bachelor curricula on precision agriculture, (while our curricula was ready, as the EU partners had noticed in their reviews). Due to all of these reasons, pilot teaching has not been fulfilled. All these motivate to request one year extension for Cupagis.

Thank you for you attention!

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