Erasmus+ Ka2 D.E.L.T.A. Project

***D*rones: *E*xperiential *L*earning and New *T*raining *A*ssets**

Newsletter no. 5 – May 2019

At a glance

Did you know that many current job positions will not exist anymore in 10 years time? And did you also know that in 10 years time there will be many job positions that don't even exist today?

Most future job require STEM knowledge skills but more than 20% EU students perform low in STEM literacy.

Millions of STEM skilled workers are needed from the the job market but education strives to fill the gap!

DELTA Project's ambition is such alike: improving STEM literacy and skills in VET students thanks to Drone's technology, also preparing them for the tough job market of the future!

Why drones?

Students enrolled in VET courses often put endless efforts in studying Mathematics and Physics. Subjects are perceived as difficult and far away from real life.

Drones' technology applied to education combines learning experiences based on experiential practice, in an interdisciplinary approach:

engineering for solving design issues, production and maintenance of light aircraft, built with advanced materials that allow the flight in accordance with EU regulations;

mathematics (from trigonometry to set the flight plan, to 3D modeling through the cloud of points for volumetric calculations and remote sensing);

the physical and natural sciences to fully understand the application fields of technology.

Problem Based Learning

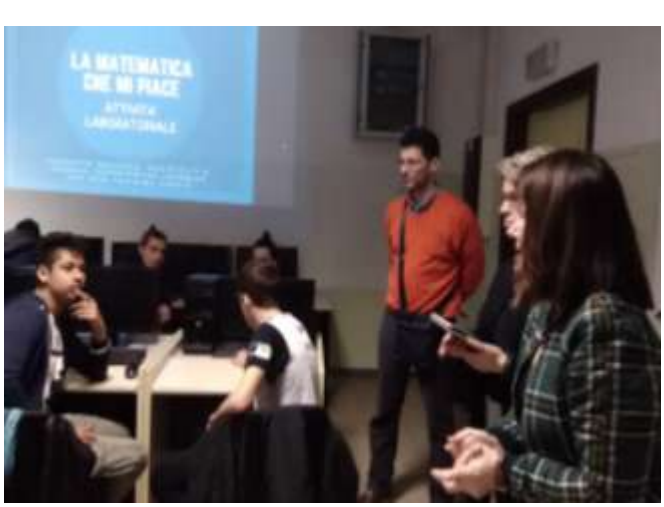
The motivation to learn starts with a problem: this is the methological approach that all partners share in DELTA project. When students face a problem to solve themselves, they are motivated to look for a practical solution, exploiting all the knowledge and skills that they have. This approach is more effective than the classical "chalk and talk" thoretical model of education.

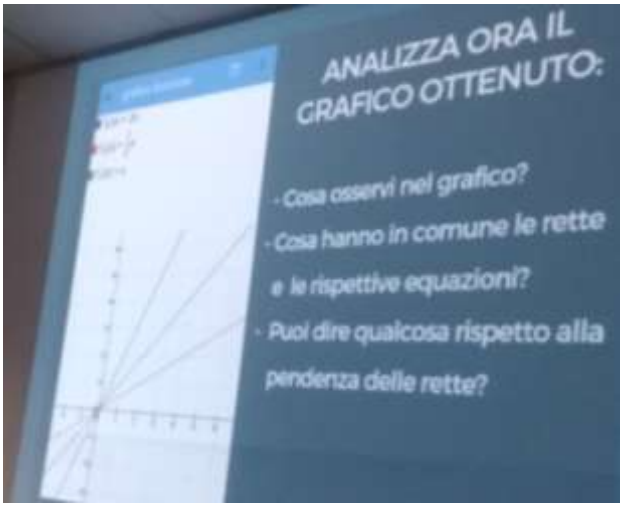
Work Based Learning

Students learn in a work-based setting according a project-work approach. Teachers are encourage to build a learning environment that simulates the real work situation but that it is also safe and protected at the same time. This methodology enhances work related skills, entrepreneurship and employability of the pupils, preparing them for their future jobs. Students are also asked to share their knowledge and skills with their peers, according to a "collaborative learning model".

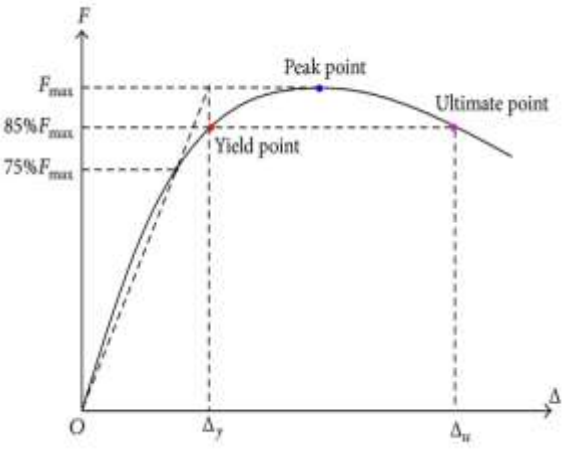
The mathematics I like

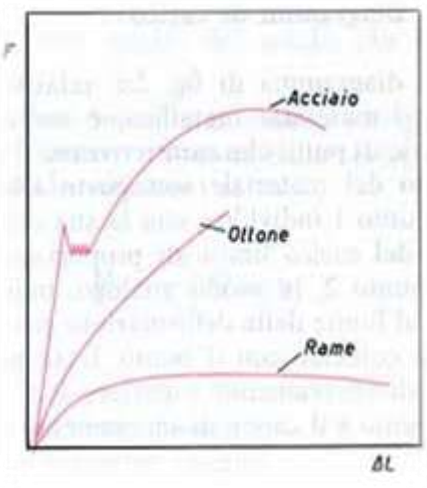
Mathematics, we know, is a difficult subject that students often face with difficulty, frightened by complexity. Often children fail to understand the practical applications of mathematics and renounce to measure themselves against calculation operations, thinking that these are topics that are far from the concrete use or resolution of real-life problems.





At the IIS Partner Institute A. Ferrari in Maranello (Modena), students applied the study of straight line equations to understand the deformation trajectory of the different materials that can be used to produce parts or components for drones, and then take better decisions for machine assembly.



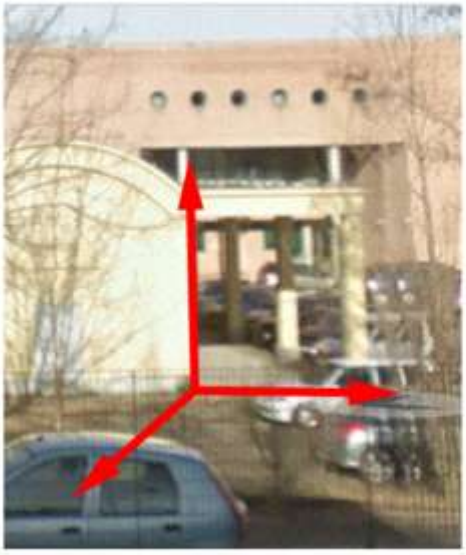


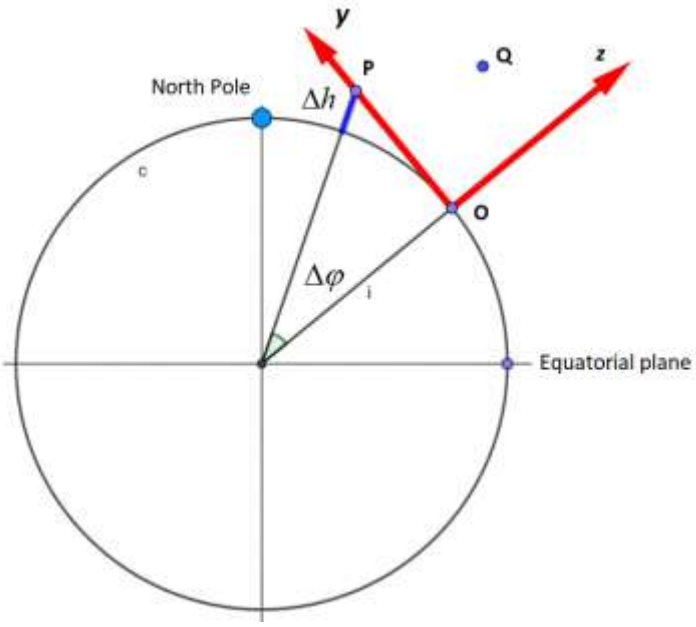
In Spain, at Corona de Aragon, the study of mathematics applied to drones has opened up the students to the horizons of photogrammetry and civil engineering works made possible by the processing of images and the resulting data ...

... and in Romania, at the IASI Liceul Teoretic de Informatica, to study the flight path of the drone by identifying the elements that make up the variables, thanks to the signals emitted by the drone sensors (GPS coordinates / proximity sensors) or predetermined before drone take-off (3D camera for the configuration of the survey points).

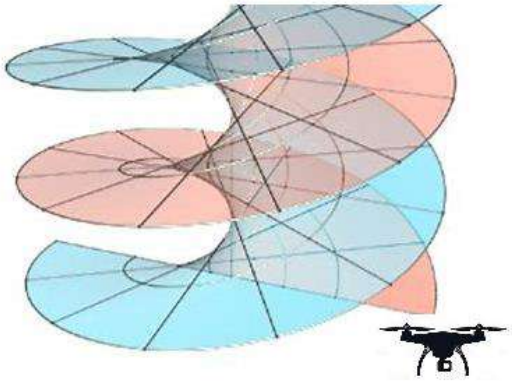
Different approaches to drones' mathematics

The application of mathematics to drones allows us to study some geo-physical phenomena by organizing a work environment according to the Work Based Learning methodology. The mathematical calculation is thus used to solve practical problems related to the management of the drone and to the processing of the data collected thanks to it.



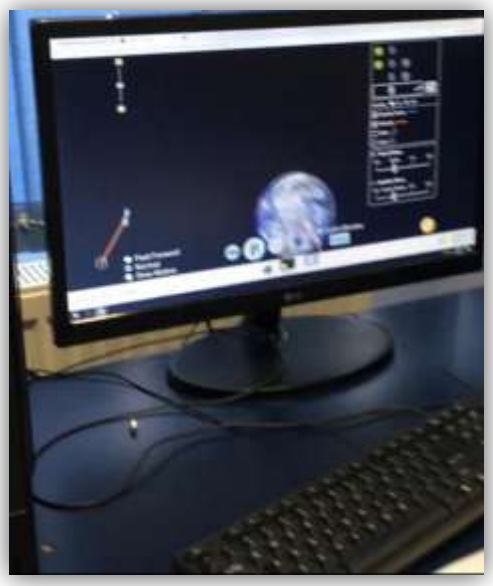


The image above, for example, proposes the calculation model for the approximation of the conversion of local coordinates into GPS coordinates, while the proposed approaches below allow to calculate the probability of failure of the drone engine, or of one of its rotors , or to use the mathematical functions to calculate the flight paths of the drone.



EVENTS: 5th-6th February 2019, 6° Transnational Meeting - Zaragoza (Spagna)

During the meeting, hosted by Partner CPIFP – Corona de Aragon from Zaragoza, Spagna, the partners discussed the educational program dedicated to mathematics applicable to drones (IO4), with particular attention to the calculation of the trajectory and the flight plan, also in order to process the data on the ground. The educational activities involved students in the calculation of the trajectory equation of a drone in the gravitational plane.



The next activities and project meetings will be dedicated to the practical application in the field of the theoretical disciplines studied in the previous phases of the project. Students will discover how to apply drones to innovative purposes in both civil and industrial settings. Stay tuned!

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