

DRONE



STEAM

DRONES@STEAM

Fostering digital Transformation in VET schools
and creating new job prospects in the labour market

Project Result No: 2

**Activity 4: DRONES@STEAM JOB-SPECIFIC SCENARIOS
FOR CODING A DRONE**

Scenario 4: A bird's eye view of our school

Lead partner(s): RDPSEA, PIT



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CONTEXT

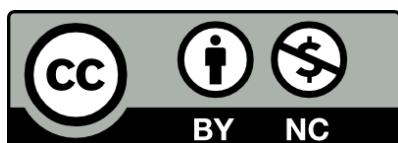
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<https://dronesteam.eu/>

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- ECAM-EPMI (ECAM) - France
- Cyprus Computer Society (CCS) - Cyprus
- Politeknika Ikastegia Txorierri S. Coop (PIT) – Spain
- National Center for Scientific Research “Demokritos” (NCSR) - Greece
- A & A Emphasys Interactive Solutions Ltd (EMP) – Cyprus
- Regional Directorate of Primary and Secondary Education of Attica (RDPSEA) – Greece



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Cross-Curricular Scenario 4: A bird's eye view of our school

1 Introduction

Aerial photography is nothing new. The first who attempt to take an aerial photograph was the famous French photographer Nadar who photographed the village of Petit Bicêtre near Paris from a stationary balloon at a height of 80 meters from the ground. Today for panoramic photos taken from a certain height, the term *bird's eye view* is used, as the result of a shot from a very high place resembles what we would see through the eyes of a bird. This is exactly what German engineer Julius Neubronner tried to do in 1903 when he experimented with cameras placed on the chests of homing pigeons to take pictures along the bird's flight path (with the help of a timer). This scenario utilizes the technology and the aesthetic approach of aerial photography.

2 Recording the problem (the need)

As part of this teaching scenario, students will use drones in order to photograph (and/or videotape) their school premises in an imaginative, creative and attractive way. The produced material (digital photos, videos) will be used to create an informative video for the Vocational Upper Secondary School that will be projected during informative visits to Gymnasiums and other events, contributing to the "opening" of the school to the local community.

In general, the of bird's eye view photography have advantages such as:

- A new perspective of the photographed place/space is created, in which points and details that cannot be perceived by an ordinary terrain photograph are highlighted,
- It gives an idea of the scale of the photographed building/space in relation to what is around it, the symmetry of a building, the arrangement of desks and the free space between them, etc.,
- A "new" world becomes visible through images of places in which we are and act daily but now these spaces are viewed from another perspective.

Today the *bird's eye view* technique finds many applications, such as landscape photography, architectural photography and photographic coverage of social, cultural or sports events. Thus, the teaching scenario introduces students to activities that are directly related to some of their future career choices, as they are described from their studies at VET schools, for example photography for the Department of Applied Sciences Arts, the mapping of buildings and exterior spaces for the Department of Structural Works, Built Environment and Architectural Design. At the same time, the construction and programming of drones is directly linked to professional employment options related to the IT, Mechanical, Electrical, Electronics and Automation Sectors, etc.

2.6 Keywords

Aerial photograph, Photographing, Photo shooting, Imprinting, Bird's eye view, Drone

3 Objectives and expected learning outcomes.

- Control and selection for parameters of proper photographic shooting, adapted to the particularities of each space,
- Safe handling of the drone for mapping of the spaces,
- Data synthesis - photo and video editing,
- Cultivation of imagination and creative thinking,
- Cultivation of aesthetic criterion,
- Development of spatial thinking skills, perception of dimensional relationships and placement of objects, etc.,
- Solving a real problem.

4 Prerequisites

Students should:

- be familiar with the construction and basic programming structures of a drone,
- have the ability to safely operate a drone,
- be familiar with the basic principles of photographic shooting,
- be familiar with image and video editing programs.

5 Transversal interdisciplinary interactions

The scenario promotes interdisciplinary approaches.

- The Departments of Mechanical and Electrical Engineering, Electronics and Automation will support the team in the construction of the drone,
- The students and teachers of the Computer Science Departments will strengthen the team in the drone programming processes and in the electronic processing of the produced video,
- Students and teachers of the Applied Arts Departments will contribute to photo/video shooting and electronic image processing.

6 Implementation Steps

Step 1: Description of the problem / Reflection

Step 2: Highlighting ideas, proposals / Research Questions

Step 3: Organize and implement activities

Step 4: Edit material and create videos

Step 5: Video presentation and feedback

6.1 Time allocation

The total duration of the scenario is twelve (12) teaching hours with the possibility of limiting or extending it.

The proposed allocation of time per activity:

- Step 1: Description of the problem / Reflection (1 hour)
- Step 2: Highlighting ideas, proposals / Research Questions (1 hour)
- Step 3: Organize and implement activities (4 hours)
- Step 4: Edit material and create videos (5 hours)
- Step 5: Risk video presentation and feedback (1 hour)

6.2 Step 1: Description of the problem / Reflection (1 hour) (Discussion with all team members)

- Projection of selected photos taken with the birds' eye view technique and discuss them (with emphasis on technical and aesthetic parameters),
- Discussion on the necessity of creating an informative video for the school that will be attractive and will utilize modern perceptions of visual communication.

6.3 Step 2: Presentation of ideas, proposals / Research Questions (1 hour) (Work in groups / plenary session)

- Selection of school areas for photography, desired shooting angles, etc.
- Formulation of ideas for the use of drones in photographing school premises.

6.4 Step 3: Organization and implementation of activities (4 hours) (Working in groups in the classroom, in the laboratory and in the school premises)

- Drone test shots for familiarization, identifying problems/difficulties and improving the process,
- Photography/ videography with terrain photography techniques of the selected school premises,
- Photography / videography with the Bird's eye view technique and use of drones of the selected school premises.

6.5 Step 4: Editing material and creating videos (5 hours) (Work in groups in the classroom, in the laboratory and in the school premises)

- Comparison of footage taken from ground and drone shots. Discussion of the advantages offered by the drone shots from an aesthetic point of view,
- Selection of the best photos, snapshots of school premises,
- Electronic image and video processing,
- Creation of an informative video utilizing the material selected, composition or selection of appropriate musical substrate, writing an informative narrative text, etc.

6.6 Step 5: Video presentation and feedback. (1 hour) (Application/ Presentation/ Testing)

- Projection of the video to the students and teachers at the school,
- Recording opinions on the result obtained through the completion of questionnaires,
- Posting the video on the school's website,
- Use of the video during school presentations, school events, etc.

7 Reflection, feedback and scenario evaluation

It is important for the students themselves to reflect on what they think they gained from their participation in the implementation of the teaching scenario, what elements in their opinion worked positively or negatively, how they collaborated with their classmates, etc.

Therefore, a continuous process of formative evaluation is proposed, which will take place in all phases of the implementation of the scenario, with various methods and will be directly

linked to the proposed activities. Students are thus guided to think about their own path to learning and acquiring knowledge.

Questions that can facilitate this process are:

- What did I learn?
- What did I remember?
- What did I like?
- What didn't I like?
- What questions will I still have and what will I explore more?
- Did I work constructively with my classmates?
- Did I help my classmate when he needed me?
- Did I hear my classmate's opinion?

Indicative questionnaire:

The most important thing I gained from this or my work with this script was:	
What I liked the most:	
What made it difficult for me:	
Through my work with this scenario, what knowledge or skills have I gained that will be useful to me in my life?	
What new did I learn from the implementation of this scenario?	
What would I change in the implementation of the script to make it even better?	

8 Extensions of the script

- The skills acquired by students can be further used to map/record important historical sites in their area,
- Experts from the fields of construction, robotics and visual communication are invited to the school, follow the students' work and participate with ideas and advice,
- As the scenario is structured for the application of experiential exploratory approaches, with students working in groups, it can contribute to the introduction and effective utilization of corresponding didactic approaches in teaching practice and the educational culture of the school in general.

9 References

