Wings for the Future: A Drone Training Program for the Youth in Nuevo Cañete

The younger class with their certificates after the training

Manual Flights conducted by the students

An instructor teaching about the Phantom 4 Pro

OVERVIEW	
Flying Labs	Peru Flying Labs
Location	Nuevo Cañete, Lima, Peru
Date	10th to 14th and 16th April, 2023
Length (number of days)	5 days
Sector program (optional)	YouthRobotics

Format	In-Person
Co-organizer if applicable	University of Engineering and Technology - UTEC and UAV del Perú
SDGs	GOAL 4: Quality Education GOAL 5: Gender Equality GOAL 10: Reduced Inequalities

SCOPE & OUTCOMES	
Type of training	1. Youth/STEM training
Goal of the training	1. Certify drone instructors for the "Wings for the future"program. 2. Create drone awareness. 3. Train and empower youth and the workforce of the future. 4. Develop drone data acquisition skills. 5. Develop drone data analysis skills.
Expected outcome for participants	● Understand drones, their utility and safe operations. ● Gain basic practical flight training with Tello educational drones and professional drones (DJI Phantom 4, DJI Mavic). ● Gain proper insight on how to be a good drone pilot and follow the proper security steps.
Confirmed outcome after training	● Drone instructors were successfully trained on the uses and applications of drones, as they gained experience in drone handling and data recollection. ● Participants gained basic skills and competencies in drone technology. ● They were able not only to learn about drones theoretically, but also have practice flights. The practical flights were conducted outside the classroom for the older students and inside the classroom for the younger students. ● Instructors and children gained the understanding of the risks and safety measures involved in operating drones.

	● By the end of the training, students gained new skills and learned about the multiple uses of drones in different initiatives.
Eventual next steps	● To encourage participants to pursue STEM careers in future ● To replicate the training program within more communities in future.

PARTICIPANTS

Profiles and number of participants	● 9 university students (as instructors). ● 32 school children (8 - 18 years old).
Name of participants' organizations	Colegio Miguel Grau of the Centro Poblado Nuevo Cañete
Gender ratio	15 Females : 17 Males
Who paid for the training?	Free training, paid by UAV del Peru
Participant fee rate (if applicable)	-
Scholarships offered?	The course was completely free.

CONTENT

Training components	The first phase of the project was to train 9 university students to become instructors. In the second phase, the students were divided into 2 groups. The first group consisted of 10 younger students aged 10 and 11 years old while the second group consisted of 22 older students aged between 12 to 17 years old. The two groups had a different program as the young group used the Tello drone inside the classroom. ***Younger Group*** Module 1: Introduction to Drones (1 hour) ● Introducing drone technology and its applications in various industries. ● Explaining the role of the Flying Labs with a special

focus on the local models.
- Discussing common safety rules for drones.

Module 2: Security Measures (45 minutes)
- Understanding the importance of teamwork, roles and responsibilities.
- Preflight Checklist.

Module 3: Manual Flights (1 hour 45 minutes)
- Reviewing the rules of thumb: first the right and then the left.
- Teaching how the drone controls work.

Module 4: Programming with DroneBlocks (1 hour 30 minutes)
- Teaching fundamentals of programming with blocks.
- Demonstrating the Drone following instructions.

Older Group
Module 1: Introduction to Drones (45 minutes)
- Introducing drone technology and its applications in various industries.
- Explaining the role of the Flying Labs with a special focus on the local models.
- Discussing common safety rules for drones.

Module 2: Security Measures (30 minutes)
- Understanding the importance of teamwork, roles and responsibilities.
- Preflight Checklist.

Module 3: Manual Flights (1 hour 30 minutes)
- Mounting a multi rotor and flying safely.
- Reviewing the rules of thumb: first the right and then the left.
- Carrying out flights at 5 meters altitude.

Module 4: Flight Plan and Collecting Data (1 hour)
- Demonstrating how data is collected with drones.
- Creating flight plans for mapping the location.

Module 5: Processing Data and Map Creation (1 hour)
- Creating a map from scratch, using the orthomosaic generated from the collected data.

	● Teaching the fundamentals of cartography – DOGSTAIL.
Training resources used	● Drones: Phantom 4 Pro, Mavic Pro, Mavic 2 Pro, Mavic 2 Enterprise Dual, Tello. ● Devices: iPads, Smartphones, projector and a TV Screen ● Material: PowerPoint and worksheets ● Software: PIX4Dreact, DroneBlocks, PIX4Dcapture
Approaches and methods used	● In the first phase, we trained 9 university students to become instructors in the Wings for the Future program. ● For the younger learners, we had to be more dynamic and give them breaks between modules for them to stay focused. ● We also separated the participants into smaller groups of between 3-4 students per instructor for a more personalized training. ● The first part of the training was theoretical with PowerPoint presentations of drones and security. The second part took a practical format as students assembled the drones themselves and flew them.