

One-Day Coding and Droning Crash Course for STEM Teachers in Papua New Guinea



STEM Teachers flying mini drones (DJI Tello) indoors as part of their hands-on training



Group shot of STEM Teachers with the Coding and Droning trainers from PNG Flying Labs

OVERVIEW	
Flying Labs	Papua New Guinea Flying Labs
Location	Port Moresby, Papua New Guinea
Date	March 23, 2020

Length (number of days)	One Day Crash Course (8 hours)
Sector program (optional)	YouthRobotics
Format	In-Person
Co-organizer if applicable	Port Moresby International School (Host)
SDGs	<u>GOAL 4: Quality Education</u> <u>GOAL 9: Industry, Innovation and Infrastructure</u>

SCOPE & OUTCOMES	
Type of training	<ol style="list-style-type: none"> 1. Introduction training to drones. 2. Youth/STEM training.
Goal of the training	Increase drone outreach and education.
Expected outcome for participants	<p><u>Droning component</u></p> <ol style="list-style-type: none"> 1. Learn the basics of drone parts and functions of quadcopters. 2. Learn drone movements and drone safety with mini drones. 3. Successfully plan and launch a drone operation as a team. <p><u>Coding component</u></p> <ol style="list-style-type: none"> 1. Learn the basics of Scratch programming language. 2. Do a geometry exercise to make a 'square' shape flight plan. 3. Use Scratch as a tool to remotely control mini drones.
Confirmed outcome after training	Working in teams of three enabled the teachers to work collaboratively and to effectively communicate, analyse and safely launch a drone operation according to their planned mission.
Eventual next steps	The Technology Department of Port Moresby International School has proposed to introduce a fun-filled extracurricular Introductory Droning Course for interested students. This course aims to promote STEAM (Science, Technology, Engineering, Arts, Math). COVID-19 has disrupted and delayed this proposed activity.

PARTICIPANTS	
Profiles and number of participants	A total of 12 teacher trainees, which comprises IT: 5, Science (Chemistry & Physics): 2, Arts (Music): 2, Design and Technology: 2, and Head of Technology Department: 1
Gender ratio	9 Male teachers (75%) to 3 Female teachers (25%).
Who paid for the training?	The training was paid by Port Moresby International School
Participant fee rate (if applicable)	About USD110/participant.

CONTENT	
Training components	Theory (20%): Presentation slides with interaction (Q&A). Practical (80%): Demo and Hands-On.
Training resources used	Hardware: DJI Tello (mini drones), laptops, tablets, projector. Software: Scratch programming language. PPE: Safety glasses, safety vests, safety cones, safety tape.
Approaches and methods used	<p><u>Droning component</u></p> <p>- All 12 teachers participated in this hands-on training. They were put into teams of three with each member switching roles between: 1) a pilot in command (PIC), 2) a visual observer (VO), and 3) a recorder. The PIC flies the mini drone, the VO assists the PIC with situational awareness while the recorder documents the drone flight.</p> <p><u>Coding component</u></p> <p>- All 12 teachers used their own laptops pre-installed with the Scratch programming language for a geometry exercise to make a 'square' shape flight plan.</p>