

## 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	
<b>Flying Labs</b>	Papua New Guinea Flying Labs
<b>Location</b>	Port Moresby, Papua New Guinea
<b>Date</b>	March 23, 2020

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

SCOPE & OUTCOMES	
<b>Type of training</b>	<ol style="list-style-type: none"> <li>1. Introduction training to drones.</li> <li>2. Youth/STEM training.</li> </ol>
<b>Goal of the training</b>	Increase drone outreach and education.
<b>Expected outcome for participants</b>	<p><b><u>Droning component</u></b></p> <ol style="list-style-type: none"> <li>1. Learn the basics of drone parts and functions of quadcopters.</li> <li>2. Learn drone movements and drone safety with mini drones.</li> <li>3. Successfully plan and launch a drone operation as a team.</li> </ol> <p><b><u>Coding component</u></b></p> <ol style="list-style-type: none"> <li>1. Learn the basics of Scratch programming language.</li> <li>2. Do a geometry exercise to make a 'square' shape flight plan.</li> <li>3. Use Scratch as a tool to remotely control mini drones.</li> </ol>
<b>Confirmed outcome after training</b>	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.
<b>Eventual next steps</b>	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	
<b>Profiles and number of participants</b>	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
<b>Gender ratio</b>	9 Male teachers (75%) to 3 Female teachers (25%).
<b>Who paid for the training?</b>	The training was paid by Port Moresby International School
<b>Participant fee rate (if applicable)</b>	About USD110/participant.

CONTENT	
<b>Training components</b>	Theory (20%): Presentation slides with interaction (Q&A). Practical (80%): Demo and Hands-On.
<b>Training resources used</b>	<b>Hardware:</b> DJI Tello (mini drones), laptops, tablets, projector. <b>Software:</b> Scratch programming language. <b>PPE:</b> Safety glasses, safety vests, safety cones, safety tape.
<b>Approaches and methods used</b>	<p><b><u>Droning component</u></b></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><b><u>Coding component</u></b></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>