# STEM Education Outreach Programme



*Diego (Uganda Flying Labs) guiding participants through a demonstration session and coding experiments using STEM kits*

| OVERVIEW | |
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| **Flying Labs** | Uganda Flying Labs |
| **Location** | Kampala, Uganda |
| **Date** | 2nd February, 2023 – 4th April, 2023 |
| **Duration of activity** | 10 weeks |
| **Sector program (optional)** | YouthRobotics |
| **Format** | In-person |
| **SDGs** | GOAL 4: Quality Education |

| SCOPE & OUTCOMES | |
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| **Type of training** | STEM Training |
| **Goals of the training** | <ul><li>To present concepts of science and technology in a way that is simplified, easy to understand, and fun.</li><li>To stimulate interest in STEM for future careers.</li><li>To create awareness and innovativeness in the applications of STEM concepts in daily life.</li></ul> |
| **Expected outcome for participants** | <ul><li>To gain an understanding of how robots work and how to make robots on their own.</li><li>To carry out exciting STEM experiments.</li><li>To learn how to fly drones manually and automatically.</li></ul> |
| **Confirmed outcome after training** | <ul><li>Participants understood the functions of stem kit components and</li></ul> |

| | their real-world applications. |
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| | • Participants were able to categorize STEM kit components in accordance with their classes of function and assemble them in the correct order.<br>• Participants were able to use stem kits components in isolation or in combination to demonstrate real world applications.<br>• Participants also appreciated some core concepts of science from demonstrations with the STEM kits. |
| **Eventual next steps** | To organize a boot-camp during the school holiday to further train interested students on STEM and further expound on the concepts of robotics. |

## PARTICIPANTS

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| **Profiles and number of participants** | 4 students (aged 10 – 13) |
| **Name of participants' organizations** | The North Green Schools |
| **Gender ratio** | 4 Boys : 0 Girls |
| **Who paid for the training?** | Parents and Guardians |
| **Participant fee rate (if applicable)** | USD 37 |

## CONTENT

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| **Training components** | 1. Robotics (Twin Science STEM kit)<br><br>• Introduction to Robotics (orientation)<br>• Understanding kit's components and simple demonstration<br>• Basic programming (with the TWIN Coding mobile application)<br>• Demonstrations of robotics application in the real-world scenarios<br><br>2. Drones (Simple basics with DJI Tello)<br><br>• Introduction to drones<br>• Understanding drone kit components<br>• Safety consideration before flight<br>• Manual flights<br>• Tello Edu/ Drone blocks<br><br>A total of 7 sessions were conducted with each lasting 40 minutes. |
| **Training resources used** | Hardware<br>• Laptop<br>• Tablet |

|  | ● Twin Science Robotics Kit <br> ● DJI Tello drone kit <br><br> Software <br> ● Twin Coding mobile application <br> ● Tello Edu |
| --- | --- |
| **Approaches and methods** | Introductory overviews (remarks) <br> ● This was used to get started on a new topic, expounding on its relevance in the real-world, the core concepts applied and the capacity for replication of the concepts with training kits <br><br> Q&A <br> ● This was aimed at keeping the students engaged in each session. It also served the function of getting to understand the pupils' perspectives on the topic of discussion and their understanding of concepts behind the application. This provided a platform for the facilitator(s) to stimulate the thinking of the learners and served as a building block upon which those concepts could better be understood and appreciated. <br><br> Videos <br> ● These were used as complementary learning tools that would give an alternative point of view (other than the instructor's) about the topic at hand. Attention was paid to the ability of the video to explain a concept in a simplified, easy to understand manner. <br><br> Demonstrations <br> ● These were aimed at showcasing the applicability of the concepts for solutions with the use of the hardware kits along with, in some instances, aspects of coding. This involved the instructor for the greater part while the learners mostly observed. <br><br> DIY sessions <br> ● This served the purpose of stimulating thinking and testing the grasp of the learners' understanding of the concepts taught and how to use the resources available to them to replicate real-world solutions. The input of the instructor was in this case limited to an assistive (corrective) role to help the students fulfill the training objectives. |