STEM x ENTREPRENEURSHIP

CubeSat as an Educational Tool for Nurturing

Active Learners & Global Citizens

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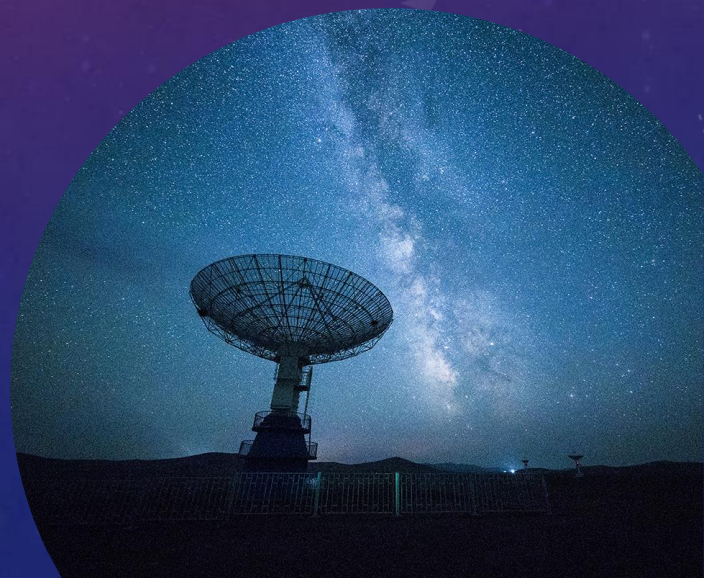
Active Learning approach

"Involve students in 'doing' things and reflecting on what they are doing." (Misseyanni, Lytras, Papadopoulou, & Marouli, 2018, p.1)

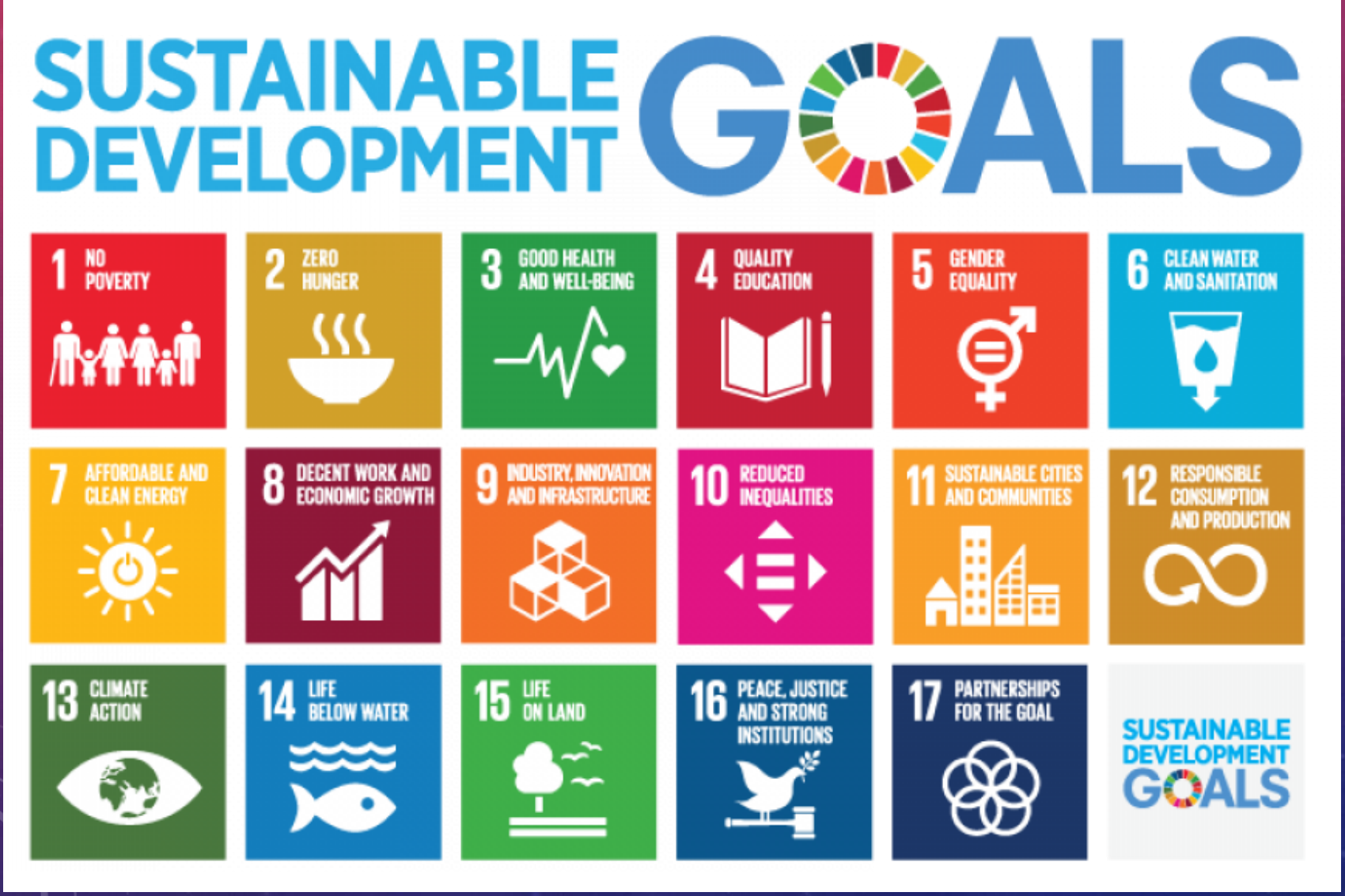
| Immersion | Exploration | Reflection |

By adopting Active Learning approach, this programme:

- Enhances participants' motivation to learning
- Offers participants opportunities to take control of their own learning processes through the hands-on experience
- Stimulates higher thinking processes
- Fosters the abilities to create new knowledge



TAKING ROLES TO EXPLORE SOLUTIONS FOR



UNITED NATIONS

https://sdgs.un.org/goals

TO SEE THE WORLD AS GLOBAL CITIZENS

PROGRAMME INTENDED LEARNING OUTCOMES (PILO)

By the end of this programme, students will be able to:

PILO 1: Communication

Communicate ideas and knowledge with the project stakeholders and general public in various forms of communication (written, verbal and visual).

PILO 3: Leadership & Collaboration

Demonstrate leadership (as a leader) and collaboration (as team player) whenever needed at different stages of the project.

PILO 2: Project Management

Manage STEM-based Science and/or entrepreneurial based project in a reflective manner.

PILO 4: Problem Solving

Apply design thinking and satellite technology/knowledge to propose solutions for solving real-life problems with no single answer.

	PILOs	Topics/Episodes	Activities	Deliverables
1	Communicate ideas and knowledge with the project stakeholders and general public in various forms of communication (written, verbal and visual).	- Marketing/funding missions (Episode 3) - Communication and fundraising (Episode 4) - Tips and ideas for compiling presentations (Episode 6)	- Producing "pitch deck" and video for marketing, publicity and fund-raising; - Oral/written/digital communication with team members, mentor and/or adviser (such as project progress reporting, log book writing or reflection on the MS Teams, etc.).	- "Pitch deck" and video for fundraising; - School presentations.
2	Manage STEM-based Science and/or entrepreneurial based project in a reflective manner.	- Defining missions and managing project (Episode 2) - Marketing/funding missions (Episode 3) - Project management (Episode 4) - Project payloads (Episode 5)	- Project development, deployment and execution*; - Meetings with mentor and/or adviser for project progress reporting; - Writing log book or reflection on the MS Teams; - Feedback from the judges on pitch deck, videos and presentations.	- Reporting project progress to mentors; - Log book writing or reflection on the MS Teams.
3	Demonstrate leadership (as a leader) and collaboration (as team player) whenever needed at different stages of the project.	- Team roles and selection (Episode 2) - Communication (Episode 4)	- Project development, deployment and execution*; - Team management; - Producing pitch deck and video for marketing, publicity and fund-raising.	- "Pitch deck" and video for fundraising; - School presentations.
4	Apply design thinking and satellite technology/knowledge to propose solutions for solving real-life problems with no single answer.	- Space Science, Astropreneurship and Satellite technology/knowledge (Episode 1) - CubeSat mission structure (Episode 2) - Formulate CubeSat mission by Design Thinking (Episode 2) - Technical requirements (Episode 3) - Data analysis and management (Episode 4) - 3-D printing (Episode 5) - CubeSat Build and Subsystems (Episode 6)	- Short quizzes after each episode (for reinforcing student learning and providing feedback to address any misconceptions).	- CubeSat prototype; - "Pitch deck" and video for fundraising; - School presentations.

* Project development, deployment and execution, includes:

- Conceptualising space missions for specific global issues;
- Defining project objectives;
- Designing original solutions;
- Scheduling actions and deadlines;
- Coordinating members with specific strengths on relevant tasks;
- Collaborating with members;
- Budgeting a project;
- Fund-raising;
- Building and testing prototype;
- Collecting and analysing data.

Microsoft Teams will be used to support student learning.

PROGRAMME EVALUATION

To collect perspectives from participants on the programme contents, delivery, etc.

EDUCATION RESEARCH

To investigate the impacts of the programme on student learning by

- consents will be collected from participants and school teachers in due course.
- arranging interview/survey with participants and teachers
- doing case studies