



1st July 2023 to 30th June 2025

**Hands-On Toxicology Science: STEM Education
Anti-Drugs Programme 2023-25
BDF 220003
The Hong Kong Federation of Youth Groups**



**Hands-On Toxicology Science: STEM Education Anti-Drugs
Programme 2023-25**

1. Introduction

2. Project Content

3. Output and Outcome Evaluation

4. Experience Gained

5. Other Findings and Conclusion



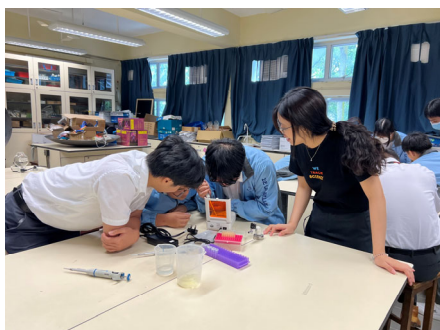
Introduction

- **Hands-On Toxicology Science: STEM Education Anti-Drugs Programme 2023–25**
- Hands-on Toxicology Science: STEM Education Anti-drugs Programme 2023–25 is a territory-wide, preventive drug education project that advanced the mission of educating youth on the harmful effects of drugs through a STEM approach. The programme responded to the growing challenge of hidden drug use and rising misconceptions about cannabis and CBD products by equipping students with scientific knowledge, critical thinking, and practical refusal skills.
- This project expanded upon the pioneering Phase I (BDF 200003) initiative, which first introduced STEM education into the anti-drug field. In this phase, a total of eight curricula were offered. The original four modules—covering forensic toxicology, data science, neuroscience, and design thinking—were enhanced, while four new workshops were introduced: DNA Profiling, Cell Biology, UX/UI, and Artificial Intelligence. Together, these interdisciplinary workshops integrated Science, Technology, Engineering, and Mathematics to provide a deeper and more comprehensive learning experience.
- Beyond classroom workshops for secondary school students, the project also provided teachers' training workshops that equipped educators with practical tools, teaching kits, and facilitation skills to sustain anti-drug education in schools. Tertiary students were recruited as anti-drug STEM ambassadors, receiving advanced training to advocate among their peers and assist in workshop delivery. In addition, 1,015 free anti-drug STEM Teaching Kits were distributed to secondary schools, ensuring the long-term integration of drug education into the school curriculum.
- Through these enhanced and expanded measures, Phase II successfully raised awareness of drug harms—particularly cannabis—cultivated positive life attitudes, and strengthened resistance to peer pressure, contributing to long-term preventive education.



Project Content

- **A1 Anti-drug STEM Workshops for Secondary Schools and Community Centres**
- Anti-drug STEM workshops in toxicology, neuroscience, data science or design thinking, DNA Profiling, Cell Biology, UX/UI, and Artificial Intelligence were carried out to secondary school students. The students had participated in hands-on activities to learn about the knowledge and rectify the misconception about drugs.



Students were performing gel electrophoresis, to understand the genetic identification method to cannabis strains.

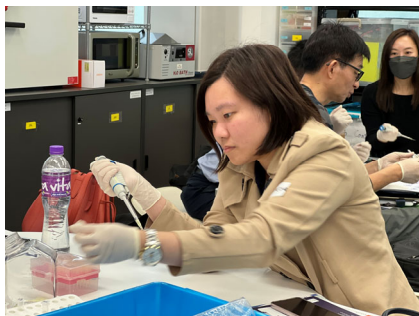


Student was setting up the anti-drug chatbot in artificial intelligence workshop.



Project Content

- **A2 Anti-drug STEM Training Workshops for Secondary School Teachers**
- The teachers learned about the adverse effect of drug in lecture and hands-on activities from the training workshops. The training also covered the experience and teaching strategies to effectively increase the anti-drug attitude for the students.



Teacher was performing cell biology assay, understanding the harmful effect of cannabis to cells.



Teachers were attending Artificial Intelligence workshops.

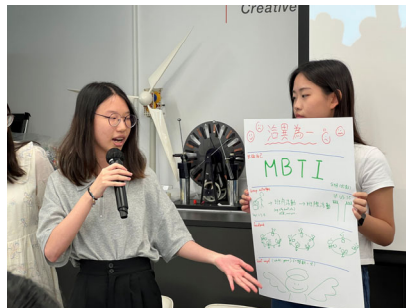


Project Content

- **A3 Anti-drug Ambassadors Training Workshops for Tertiary Students**
- The training workshops were specifically designed for tertiary students who were interested in developing their career in education. The training covered not only the workshop contents, but also workshop on extended drug knowledge, curriculum development and classroom management. Therefore, the participants had increased efficacy in conducting anti-drug STEM workshops. Selected ambassadors were invited to assist in subsequent anti-drug workshops for schools. It empowered them to spread the anti-drug attitude and positive lifestyle to more youth.



Anti-drug ambassadors were learning the severe penalties of possession of dangerous drugs.



Anti-drug ambassador proposed innovative idea for high-risk youth in design thinking workshop.



Project Content

- **A4 Anti-drug STEM Teaching Kit for Secondary Schools**
- Free Anti-drug STEM Teaching Kit was produced and dispatched to all secondary schools in Hong Kong after collecting and implementing the feedback of the 8 workshops. The kit included the teaching materials of all 8 workshops, e.g. Teaching plan, PowerPoint and worksheet.



The Anti-drug STEM Teaching Kit dispatched to all secondary school. It included the teaching plan, drug knowledge and a QR code to download all course materials.



Project Content





Output and Outcome Evaluation

- Evaluation methods
- Output and outcome benchmarks
- Evaluation results



Output Evaluation

	Expected Result	Achieved Result	Remark
Output Indicator 1	Deliver 100 sessions of anti-drug workshops to no less than 3 000 secondary school students, among which 2 700 students attend at least 1 session	Delivered 105 sessions of anti-drug workshops (105%) to no less than 3,047 secondary school students, among which 2,843 students attended at least one session	N/A
Output Indicator 2	Deliver 10 sessions of anti-drug training workshops to no less than 200 teachers, among which 160 attend at least 1 session	Delivered 10 sessions (100%) of anti-drug training workshops to no less than 229 teachers, among which 169 attended at least one session	N/A
Output Indicator 3	Deliver 12 sessions of anti-drug ambassador training workshops to 60 tertiary school students, among which 50 attend at least 4 sessions	Delivered 12 sessions (100%) of anti-drug ambassador training workshops to 69 tertiary school students, among which 69 attended at least 4 sessions	N/A
Output Indicator 4	Produce and deliver 1,000 sets of anti-drugs STEM teaching kit to secondary schools	Produced and delivered 1,015 sets of anti-drugs STEM teaching kit to secondary schools	N/A

 Outcome Evaluation			
	Expected Result	Achieved Result	Remark
Outcome Indicator 1	Participants show improvement in their understanding about the harm of drugs (70% of participants show improvement in understanding / statistically significant improvement in understanding as indicated by paired t-test)	500 sets of questionnaires collected. 87.6% of participants showed improvement in their understanding about the harm of drugs	N/A
Outcome Indicator 2	Participants show improvement in self-efficacy to refuse drugs (70% of participants show improvement in self-efficacy to refuse drugs / statistically significant improvement self-efficacy to refuse drugs as indicated by paired t-test)	500 sets of questionnaires collected. 83.4% of participants showed improvement in self-efficacy to refuse drugs	N/A
Outcome Indicator 3	Participants gain knowledge about the harm of cannabis abuse (70% of participants gain knowledge about the harm of cannabis abuse / statistically significant gain in knowledge about harm of cannabis abuse as indicated by paired t-test)	150 sets of questionnaires collected. 88.0% of participants gained knowledge about the harm of cannabis abuse	N/A
Outcome Indicator 4	Participants show improvement in skills to conduct anti-drug STEM workshop activities (70% of participants show improvement in skills to conduct anti-drug STEM workshop activities / statistically significant improvement in skills to conduct anti-drug STEM workshop activities as indicated by paired t-test)	150 sets of questionnaires collected. 90.7% of participants showed improvement in skills to conduct anti-drug STEM workshop activities	N/A
Outcome Indicator 5	Participants show reduction in permissive attitude towards smoking Cannabis (70% of participants show reduction in permissive attitude / statistically significant reduction in permissive attitude as indicated by paired t-test)	60 sets of questionnaires collected 83.3% of participants showed reduction in permissive attitude towards smoking Cannabis	N/A
Outcome Indicator 6	Participants show improvement in skills to conduct anti-drug STEM workshop activities (70% of participants show improvement in skills to conduct anti-drug STEM workshop activities / statistically significant improvement in skills to conduct anti-drug STEM workshop activities as indicated by paired t-test)	60 sets of questionnaires collected 100% of participants showed improvement in skills to conduct anti-drug STEM workshop activities	N/A





Experience Gained

Innovative STEM-based approach

The workshops were collaboratively developed by educational institutions and HKFYG. Their domain knowledge had enriched the content of the curricula and provided innovative and unique learning experience for the participants. HKFYG adjusted the curricula based on feedbacks and actual needs of the participants. Emerging trends such as AI, UX/UI, coding, and cannabis misconceptions showed that anti-drug education must keep evolving to remain relevant, engaging, and aligned with broader STEAM policy directions.

Multi-tiered impact on the community

The project extended beyond students to empower teachers and tertiary ambassadors. Teachers gained practical training and free STEM kits, enabling them to embed the content in their own classrooms. Tertiary students became anti-drug ambassadors, assisting in workshops and building facilitation experience while strengthening their own anti-drug attitudes. This three-tier model created a multiplier effect: students benefitted directly, teachers ensured sustainability in schools, and ambassadors extended peer-led advocacy.

Scalability and long-term integration through resources

Despite the project activities were only available to school did not participated in Healthy School Programme (around 340 school), the project reached 62 schools. The promotion of the project is backed by extensive network from HKFYG. The ready-to-use anti-drug STEM teaching kit allowed schools to continue anti-drug education independently beyond the funded project period. The design ensured long-term sustainability, embedding STEM anti-drug content into the teaching culture rather than as one-off activities.



Conclusion

- Hands-on Toxicology Science: STEM Education Anti-drugs Programme 2023–25 further advanced preventive anti-drug education by deepening the integration of the STEM teaching approach. A total of 8 themed anti-drug workshops were developed and delivered, combining enhancements to the existing 4 curricula with 4 newly designed modules. Altogether, the project conducted 105 sessions of workshops for over 3,000 secondary students. Participants not only strengthened their knowledge about the harmful effects of drugs, but also developed essential future skills, including self-efficacy, critical thinking, collaborative skills, and analytical mindsets, which were crucial in building a positive lifestyle and resisting peer pressure.
- Beyond student workshops, the project extended its reach through multiple capacity-building initiatives. Ten sessions of teacher training workshops were conducted for 229 teachers, equipping them with practical tools and teaching resources to sustain anti-drug education in their schools. 12 sessions of ambassador training were organised for 69 tertiary students, all of whom completed the full training and enhanced their facilitation and advocacy skills. In addition, 1,015 anti-drug STEM teaching kits were produced and distributed to secondary schools, enabling long-term adoption of STEM-based anti-drug education.
- The project results clearly demonstrated its effectiveness. Over 87% of participants improved their understanding of the harm of drugs, 83% enhanced their self-efficacy to refuse drugs, and 88% gained specific knowledge about cannabis abuse. Teachers reported greater confidence in applying the curricula, while tertiary ambassadors acquired practical experience in conducting workshops. Feedback from schools, students, and teachers also highlighted the strong demand for interactive, innovative anti-drug education and confirmed the programme's alignment with the latest educational directions. Through these directions, the project will continue to empower youth to adopt anti-drug attitudes and extend awareness across the wider community.



Suggestion and Way forward

■ **Suggestion**

■ **Strengthen Cross-sector Collaboration**

- Deepen partnerships with universities, NGOs, and government departments to co-develop curriculum content, research-based evaluation, and outreach activities. And engage healthcare professionals and social workers to integrate scientific learning with real-life preventive messages, making anti-drug education more holistic.

■ **Nurture Youth Leadership**

- Provide further mentorship and capacity-building for tertiary ambassadors to transform them into peer trainers, enhancing continuity and multiplier effects.
- Encourage ambassadors to design their own mini-projects (hackathons, peer-led campaigns) to localize advocacy in their own communities.

■ **Way forward**

■ **Scale Up and Institutionalize**

- Position the project as a model curriculum that can be formally integrated into STEM and Life Education frameworks across Hong Kong schools.
- Advocate for Education Bureau endorsement to mainstream STEM-based anti-drug learning materials into the broader school curriculum.

■ **Build a Sustainable Resource Hub**

- Establish an open-access digital repository of teaching kits, lesson plans, and workshop recordings to ensure continuity beyond funding cycles.