

Dedicated Funding Programme for Publicly-funded Schools

Project Number: 2022/0297 (Revised)
Name of School: 港青基信書院
YMCA of Hong Kong Christian College
Project Title: 智能移動農場
Farmunity --- Learning in Smart Mobile Farming System
(STEAM Education)
Beneficiaries: Secondary
Estimated Number of Direct Beneficiaries: Student:510 (S1 – S6)
Teacher: 45
Parent:510

1. Project Needs

1.1 Project aim(s)

This project aims to provide students hands-on farming experience by introducing a Smart Mobile Farming Machine at our school. The primary goal is to enhance students' learning competencies in STEAM (Science, Technology, Engineering, Arts, and Mathematics) education by integrating advanced Green Technology within the mobile farm machine.

Students will have the opportunity to participate in a specialized **pull-out Gifted STEAM Programme** for selected S3 and S4 students and comprehensive STEAM Lessons for all S1 students. These initiatives aim to enrich students with knowledge and hands-on and minds-on experience that aligns with the Junior Secondary (JS) Science curriculum, specifically the **STEAM Learning Module** contextualized within daily farming activities.

Through the farming project, we will expand the scope of the school-based STEAM Learning Module to include key areas such as **“Innovation and Technology,” “Engineering Practices,” and “Data Processing.”** Active student participation in the project will deepen students' understanding of the interplay between science and technology while also enhancing their awareness of global food sustainability issues.

Additionally, the project will incorporate the elements of **machine learning and computer vision** from the **Module on Artificial Intelligence for Junior Secondary Level**. These elements will be integrated through **various learning activities** within the **pull-out Gifted STEAM Programme** facilitated by the smart farm. Moreover, this project aims to develop our **school-based Life Education** by cultivating life skills and empathy among students. By growing crops in the Smart Mobile Farming Machine and donating the harvest to those in need, students will engage in meaningful community services, thereby nurturing a sense of social responsibility and connection to be broader community.

1.2 School-based innovative element(s)

The project introduces innovative school-based elements that enhance STEAM Education, Life Education, and Career Planning. In recent years, our school has organized an after-school STEM programme to nurture students who excel academically and show a keen interest in STEM activities. We are poised to take a significant step forward by integrating STEAM education more thoroughly into our everyday learning and teaching practices.

Students will be afforded numerous opportunities to acquire relevant knowledge and skills. Additionally, installing a smart mobile farming machine will enable them to engage in more hands-on learning experiences. This practical application will allow students to directly implement what they have learned from the Junior Secondary (JS) Science curriculum, particularly the STEAM Learning Module. As a result, their educational

experiences will be considerably enriched, providing them with meaningful insights and skills that bridge theoretical knowledge with real-world application.

1.3 Meeting with school-based/students' needs

Item: Relevance to the school development plan of this cycle/major concern

Our School is a learning community where quality education based on Christian beliefs and values, is offered in a joyful and stimulating setting. We believe that the foundation of this learning community is the partnership among teachers, parents, and students.

Our School's Major Concerns are focused on improving the learning effectiveness of our students by

- 1) developing their independence and resilience,
- 2) educating the whole school community about the PERMA model for well-being and
- 3) embedding positive values and attitudes in our extra-curricular programmes.

To achieve these goals, we propose the cross-disciplinary smart farm project, which comprises 15 face-to-face pull-out Gifted STEAM lessons for S3 IS and ICT Students and S4 and S5 BAFS students, three external visits, a series of hands-on learning activities in S1 STEAM lessons and a STEAM Exhibition to enhance students' independence and resilience and S1 -S3 students' understanding of the Science (S1-3) STEAM Learning Module. In addition, this project could also enhance students' interest and abilities in learning science and Innovation and Technology (I & T) through the "hands-on and minds-on" cross-disciplinary learning activities.

2. Project Feasibility

2.1 Key concept (s)/rationale(s) of the project

Item: Reference the Education Bureau curriculum documents/guidelines

The rationale of this project comes from integrating Green Technology within our Smart City and the recommendations outlined in the "Report on Promotion of STEM Education - Unleashing Potential in Innovation" issued by the Education Bureau in December 2016 through connecting STEAM content to real-world applications. Key objectives of the project include:

- 1) to promote STEAM Education by enriching our school-based curricula of the Science, Technology, and Mathematics Education Key Learning Areas (KLAs) with more Innovation and Technology (I & T) elements as via smart farm STEAM learning activities
- 2) to enrich students' learning experiences through cross-disciplinary smart farm STEAM project.
- 3) to enhance professional development for teachers on relevant STEAM learning activities.

Through the project, we will review and modify our school-based junior secondary Science Education curriculum with particular focuses on enhancing the learning activities in "Innovation and Technology", "Engineering Practices" and "Data Processing" elements in Science (S1-3) STEAM Learning Module. In complement to the growing development of STEAM education in Hong Kong and the updated integrated science syllabus for junior form, we designed a project combining the concept of sustainability with the foundational disciplines of STEAM, including:

S (Science) – Investigative skills, scientific experimental design, controlled experiments, photosynthesis & seed germination

T (Technology) – Computer programming write-up, optimization & trial and error, IoT studies

E (Engineering) – Mobile Farm design studies and Smart Hydroponic Mobile Farm setup

A (Arts) - Growth of plants/flowers for producing ornaments and souvenirs for school events
M (Mathematics) – Data Science (extraction, clean data and establishing data trend)

The link between all disciplines is the balanced execution of each throughout the program, using one project to assess a wide range of skills and abilities. This program includes guided tours, theory & knowledge-based classes, and small-group scientific experiments. These learning approaches also apply to subjects such as Science, BAFS, and Life Education.

On the other hand, one of the major concerns our school focuses on is building up students' confidence and a sense of achievement through the implementation of FIVE CORE VALUES of the school: "Build a community that cares," "Serves one another in love," "Be responsible," "Act with integrity" and "Respect ourselves and others." Community services and Life Education are the emphasis of this project. It provides a real-life opportunity for students to serve the community by growing and donating vegetables to the elderly around our school.

2.2 School's readiness

Item: Relevant school experience

Our teachers in the STEAM Committee will be responsible for this QEF project.

By incorporating STEAM education, we aim to implement and promote the mobile farming project, which encourages students to understand cross-curriculum subject matters, plant various species of vegetables and herbs on their own, learn the method of plant care, and study the best conditions for growing plants.

The suggested location of the farming machine would be near the canteen on the ground floor so that it would be more accessible to students for any follow-up activities during school hours. In addition, it is an indoor area with cover, and thus, the machine could be safely operated all year, even during days with unstable weather.

2.3 Principal and teachers' involvement

School Staff: Principal

Duties: Monitor and supervise, Process funding

School Staff: Project Leader

Duties: Coordinate/collaborate, Plan curriculum/activities, Conduct / participate in activities

School Staff: Subject panel head

Duties: Plan curriculum/activities, Conduct / participate in activities, Consolidate learning and teaching materials, Formulate plans

School Staff: Subject teachers

Duties: Plan curriculum/activities, Conduct / participate in activities, Consolidate learning and teaching materials

2.4 Project period

Project Start Date and End Date: from 10/2024 to 02/2026

The project lasts for 1 year and 5 months.

2.5 Details of project activities

a. Project implementation measures

Activity 1: Learning Activities: Smart Indoor Farming Basics and Hands-on Experience

Implementation Period:

10/2024 - 02/2025

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
30 from S3 Selected Students - Criteria: - Students with good academic performance in S3 IS and ICT will be shortlisted - Shortlisted students will undergo a round of selection by the STEAM Committee - Students with both good academic performance in S3 IS and ICT, and great interest in the project will be selected S3 IS students will be selected to join Engineering lessons of the pull-out STEAM Gifted Programme - engineering design and structure (lights, electricity & water supply) - IoT technologies have different sensors for plant growing environment control (e.g., pH, EC, temp, etc.) - monitor and control functions to operate the Mobile Farm S3 IS students – will be selected to join Farming lessons of the pull-out STEAM Gifted Programme - the key plant growing elements (i.e., light, pH, EC, etc.) - farming hygiene protocol - seeding and germination - measuring key plant growing elements (manual) - transplant	Lesson 1: - How to build a "farm" at school: Introduction of Smart Mobile Farm and how to operate it - Students will be introduced to the latest urban farming technology covering the following components and STEM elements: - engineering design and structure (lights, electricity & water supply) - IoT technologies have different sensors for controlling plant-growing environment parameters (e.g., pH, EC, temperature, etc.). - monitor and control functions to operate the Mobile Farm Lesson 2: - How to build a "farm" at school: Indoor farming operations tutorial - Students will learn the key plant growing elements (i.e., light, pH, EC, etc.) and indoor farming operations procedure: - farming hygiene protocol - seeding and germination - measuring key plant growing elements (manual) - transplant - regular plant care - Students will be given a chance to practice the above in Lesson 6. Lesson 3: - IoT and Cloud Overview	3 sessions (1.5 hours for each session)

regular plant care	- Introduction to IoT & edge and their applications - Introduction to Cloud & AI	
S3 ICT – IoT & Cloud - IoT and cloud elements - Introduction to IoT & edge and their applications - Introduction to Cloud & AI		

Number of school personnel and/or appointed project staff involved and respective duties:

- Technicians and instructors from the service provider will organize the activities
- Biology teachers, PSHE teachers, Integrated Science teachers, & Project Coordinators will coordinate and guide students to participate in related activities

Expected outcomes:

Students should be able to:

- describe the features and elements controlled in the Smart Mobile Farm
- distinguish which part of the machine represents the part of nature's environment, including light, temperature etc., and its effect to the plants
- control the farming environment by smart mobile farming App
- germinate, transplant, and manage the plants
- appreciate the complexity of nature

Activity 2: Extended learning activities: Assemble a School Smart Mobile Farming Workshop

Implementation Period:

10/2024 - 04/2025

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
30 from S3 Selected Students Criteria: - Students with good academic performance in S3 ICT will be shortlisted - Shortlisted students will undergo a round of selection by the STEAM Committee - Students with both good academic performance in S3 ICT and great interest in the project will be selected - S3 ICT – IoT, Cloud & AI - IoT & edge and their applications - Cloud & AI	Lesson 4: - Students will be guided to assemble five major parts of the Smart Mobile System - The Five major parts of the Smart Hydroponic system include: - Smart Mobile Farm enclosed environment, - Modular Sensor Box for Urban Farming Environment Lesson 5: - Cloud-based remote control and monitoring system, - Business intelligence (B.I) software module and - Technology programming compatible software.	2 sessions of (2 hours for each session) As the content for Activity 2 will involve more students' guidance on assembling of the smart mobile system and will also cover more complex concepts on AI and Cloud-based applications principles, each session will be

		extended to 2 hours.
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Number of school personnel and/or appointed project staff involved and respective duties:

- Technicians and instructors from the service provider company will organize the activities
- Project Coordinators & related-subject teachers will Coordinate and guide students to participate in related activities

Expected outcomes:

- Students should be able to communicate their learning on Smart Mobile Farm to different audiences
- Students should define the components of the smart mobile farming system and describe the function of each part which contributes to the operation of the Green Technology System

Activity 3: Learning Activities: General Farming Theory and Knowledge

Implementation Period:

10/2024 - 04/2025

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
• S3 IS – Farming • global food sustainability challenges • Smart Farming In Practice	Lesson 6: • The New Normal: global food sustainability challenges • How do urban farming technologies address food sustainability needs in the New Normal? • Traditional farming & agriculture technologies development in Hong Kong: How do local social innovation tackle food shortage challenges in the community? Lesson 7: • Smart Farming Practice at school: Plant species introduction with in-class testing experiment demonstration. • Students will be taught the nutrition values of different plant species (5-10 species) so they will know how to build a healthy green diet lifestyle, at the same time, they will be taught with related experiments to enhance their awareness of their plant knowledge. There will be take-home exercises for them to re-approach the topic more scientifically.	2 sessions (1.5 hours for each session)

Number of school personnel and/or appointed project staff involved and respective duties:

- Technician and instructors from the service provider will organize the activities
- Project Coordinators & related-subject teachers will coordinate and guide students to participate in related activities

Expected outcomes:

- Students should be able to:
- describe the global environmental sustainability challenges caused by agricultural activities
- link up the invention of mobile farming with current environmental issue
- take awareness on the global issue caused/faced by the agriculture industry
- describe the advantages, disadvantages and the differences between hydroponics and aquaponics

Activity 4: Onsite Technology Urban Farm Visit

Implementation Period:

03/2025 - 02/2026

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
• mobile farming technology Criteria: • Students with great interest in the project in S1 to S5 will be shortlisted • Shortlisted students will undergo a round of selection by STEAM Committee • Students with both good academic performance in S1 – S5 students and great interest in the project will be selected	• Organize 4 sessions of visits (4 hours) to connect S1-S5 100 students (25 students each session x 4 groups) with the needs of local communities and directly contribute to them by participating in urban farming activities supported by smart farming technologies. Details of the visits are as follows: Session 1: Farm-to-table restaurant visit Students will be able to learn farm operation process and how to integrate farm and restaurant. Session 2: Farm Lab Visit Students will be able to experience first-hand cutting-edge technology from incubated companies. Session 3: CEO Entrepreneurship talk Students will be able to learn from tech company's CEO for entrepreneurship and business leadership. Session 4: Innovation and problem-solving workshop Students will be able to learn innovation and problem-solving skills via the workshop.	4 sessions of visits x 4 groups (1 hour for each session)

Number of school personnel and/or appointed project staff involved and respective duties:

- Technician and instructors from the service provider will organize the activities
- Project Coordinators & related-subject teachers will coordinate and guide students to participate in related activities

Expected outcomes:

Students should be able to:

- describe the difference among traditional farming, aquaponics, and mobile farming
- describe how mobile farming technology can be applied in daily life setting

Activity 5: Learning activities: General IoT Theory and Data Visualization Experience

Implementation Period:

03/2025 - 02/2026

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
• 30 from S3 Selected Students Criteria: • Students with good academic performance in S3 ICT will be shortlisted • Shortlisted students will undergo a round of selection by the STEAM Committee • Students with both good academic performance in S3 ICT and great interest in the project will be selected S3 ICT • machine learning & computer vision • Data visualization	Lesson 8: • Understand machine learning & computer vision • Train an object detection model with custom vision • Preview of edge device, including sensors and processors (equipped with Microsoft Percept IoT development kit) Lesson 9: • Data visualization part 1: Study about Smart Mobile Farm's central operations platform, the plant growing parameters and the collected data Lesson 10: • Data visualization part 2: Introduction of Microsoft Power BI platform and how it is used to create analytics report to maximize the value of the data assets Lesson 11: • Data visualization part 3: Experience by extracting raw data from Smart Mobile Farm's cloud-based farm	4 sessions (1.5 hours for each session)

	operating platform, developing a set of dashboard and report with the Microsoft Power BI platform	
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Number of school personnel and/or appointed project staff involved and respective duties

- Technician and instructors from the service provider will organize the activities
- Project Coordinators & related-subject teachers will coordinate and guide students to participate in related activities

Expected outcomes:

Students should be able to:

- describe the features and functions of urban farming sensors and Smart Mobile Farm cloud-based operations platform
- identify and define key plant growing parameters
- operate Microsoft Power BI platform and generate analytic reports and dashboards

Activity 6: Extended learning activities: Green Entrepreneurship Programme and Community connection <u>Implementation Period:</u> 03/2025 - 02/2026		
<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
• 30 from S4 and S5 BAFS Selected Students Criteria: • Students with good academic performance in S4 and S5 BAFS will be shortlisted • Shortlisted students will undergo a round of selection by STEAM Committee • Students with both good academic performance in S4 and S5 BAFS and great interest in the project will be selected S4 -S5 BAFS • the characteristics and key success factors of entrepreneurship • market research and business interview • business requirement analysis summary/report • business plan and budget	Lesson 12: • Get inspired by learning from a green entrepreneur story! • Throughout the sharing, students will grasp the basics of identifying a fundamental need, conceptualizing a realistic solution, designing, and then developing the product or service Lesson 13: • Introduce basic business principles & ethics with business case simulation • conduct research on client background and market situation • arrange a client meeting (with a set of business questions) • analyze and confirm business requirements Lesson 14: • Understand business finances and develop sustainable budget plan	4 sessions (1.5 hours for each session)

organize promotion events and handle media communications	- understand revenue and profit and how to track business finances - learn about the fundamentals of financial forecasting - build a balanced budget plan for the simulated case Lesson 15: - Develop an event plan and formulate a marketing strategy with business case simulation - understand the key components of forming an event plan - learn about different above-the-line and below-the-line marketing and promotion strategies - learn about the media landscape, the basics of press release write up and media pitching	
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Number of school personnel and/or appointed project staff involved and respective duties

- Technician and instructors from the service provider will organize the activities
- Project Coordinators & related-subject teachers will coordinate and guide students to participate in related activities

Expected outcomes:

- Students should be able to:
- describe the characteristics and key success factors of entrepreneurship
- conduct market research and business interview
- develop business requirement analysis summary/report
- build a business plan and budget for urban farming products
- organize promotion events and handle media communications

Activity 7: Learning Activities: Smart Indoor Farming Basics and Hands-on Experience for S1 students

Implementation Period:

02/2025 - 07/2025

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
- All S1 Students (160+) will join Engineering Module of STEAM Lessons, covering - engineering design and structure (lights, electricity & water supply)	Activity Summary: All S1 IS students will be introduced to engineering design and structure (lights, electricity, and water supply). LoT technologies have different sensors for controlling the plant-growing	8 sessions 1 hour for each session (taught by STEAM teachers)

Innovation and Technology Module of STEAM Lessons, covering - IoT technologies and different sensors for plant growing environment control (e.g., pH, EC, temp, etc.) Data Processing Module of STEAM Lessons, covering - Process of data collected from different sensors for plant growing environment control (e.g., pH, EC, temp, etc.)	environment (e.g., pH, EC, temperature, etc.), monitor, and control functions to operate the Mobile Farm. In addition, all S1 students will be introduced to the applications of Cloud and AI in smart farming. Moreover, all S1 students will be introduced to measuring key plant growing elements (i.e., light, pH, EC, etc.), farming hygiene protocol, seeding and germination, measuring key plant growing elements, and transplanting regular plant care.	
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Number of school personnel and/or appointed project staff involved and respective duties

- Technician and instructors from the service provider will organize the activities
- Project Coordinators & related-subject teachers will coordinate and guide students to participate in related activities

Expected outcomes:

- To inspire and strengthen students' problem-solving and collaboration skills through technological application. A seminar hosted by tech & innovation entrepreneurs will be held to share their experience on success and failure and how cross-disciplinary skills as the cornerstone of their development

Activity 8: Life Education and Career Planning Workshop – Future Smart City & Cyberport / Science Park

Implementation Period:

02/2025 - 02/2026

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
100+ from S5 – S6 Selected Students - problem solving and collaboration skills through technological application	Activity Summary: 1. Visiting Cyberlab to understand the latest green technology development and some start-up innovations; 2. Visiting Interval to learn about how BIG DATA applies to F&B business and achieves carbon reduction. Students will take part in harvesting greens & herbs from	2 sessions 2 hours of each session

	Commercial Technology Hydroponic Farm. • Entrepreneurship Chichat Session – Learn attributes to become a young entrepreneur in Hong Kong.	
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Number of school personnel and/or appointed project staff involved and respective duties

- Technicians and instructors from the service provider will organize the activities
- Project Coordinators & related-subject teachers will coordinate and guide students to participate in related activities

Expected outcomes:

- To inspire and strengthen students' problem-solving and collaboration skills through technological application. A seminar hosted by tech & innovation entrepreneurs will be held to share their experience on success and failure and how cross-disciplinary skills as the cornerstone of their development

Activity 9: STEAM Exhibition on International Fun Fair Day

Implementation Period:

12/2025

<u>Key learning stages and key learning areas/subjects/learning elements</u>	<u>Content</u>	<u>Number of sessions</u>
• 510+ from S1 – S6 Selected Students • 510+ parents Students and parents will be invited to join workshop ornaments and souvenir production for school event	Activity Summary: A STEAM exhibition on smart farm that engages both parents and students in ornament and souvenir production from real flowers grown using the smart farm. STEAM ambassadors will be selected and trained to introduce the advanced farming system, which uses sensors, automation, and data analytics to optimize plant growth and yield, to visitors, including both parents and students, on International Fun Fair Day. Both parents and students would participate in the activity of creation of floral-themed ornaments and souvenirs using the real flowers from the smart farm on a voluntary basis.	Half-day activities

Number of school personnel and/or appointed project staff involved and respective duties

- Technicians and instructors from the service provider will organize the activities

- Project Coordinators & related-subject teachers will coordinate and guide students to participate in related activities

Expected outcomes:

- To use technological applications to inspire and strengthen students' problem-solving and collaboration skills. A seminar hosted by tech & innovation entrepreneurs will be held to share their experience on success and failure and how cross-disciplinary skills as the cornerstone of their development.

b. Teacher training (if applicable)

Workshop

Implementation Period:

10/2024 - 02/2025

Content:

Train teachers on the following pedagogies and urban farming practices:

STEAM Education Pedagogies in a smart farming context

- Project-Based Learning (PBL): Students tackle real-world smart farming challenges, such as optimizing irrigation systems or designing autonomous farming equipment, to apply their STEAM knowledge and skills.
- Inquiry-Based Learning (IBL): Students investigate the scientific principles, technological innovations, and engineering design processes that enable smart farming applications, fostering critical thinking and problem-solving.
- Design Thinking: Students engage in user-centric problem-solving, empathizing with farmers' needs, ideating innovative solutions, prototyping, and iterating, to cultivate creativity and collaboration.

Urban farming practices

- Germination
- Transplant
- plant care
- harvest
- water management (pH, EC adjustment)
- farm lab operations and facilities

Number of sessions:

- 4 Sessions of 1.5-hour teacher trainings will be provided

Teacher training conducted by school personnel/external instructor(s)

- conducted by external instructor(s)

Expected outcomes:

- Teachers are equipped with the skills in farming, plant care, and operating facilities

2.6 Budget

a. Staff cost

Post title	Full-time equivalent	Appointment requirements	Monthly salary	Mandatory Provident Fund	Employment period (months)	Amount(\$)	Justification
Sub-total on staff cost :						0	

b. Service cost

Item	Service details	Unit cost	Quantity	Unit	Amount(\$)	Justification
Instructor (Student Activity)	Pull-out Gifted STEAM Programme Sessions - Lesson 1-15 Total: 23.5 hours External Visits: Activity 4: 16 hours Activity 8: 4 hours Total: 20 hours	530	43.5	hour	23,055	Qualification: Degree in Science Experience: 4+ years in hydroponics farming
Trainer (Staff)	4 Teacher Training Sessions	860	6	hour	5,160	
Sub-total on service cost :						28,215

c. Equipment cost

Item	Specifications	Unit cost	Quantity	Unit	Amount(\$)	Justification
Smart Mobile Farm	1. Smart Mobile Farm enclosed environment infrastructure - \$32,000 2. Modular sensor box for urban farming environment - \$28,000 3. Cloud-based remote control and monitoring system - \$19,500 4. Business intelligence software module for data analysis - \$15,000 5. Software upgrade to technology programming compatible - \$22,043	116,543	1		116,543	To provide hands-on experience for students to do urban farming at school and produce crops.
Sub-total on equipment cost :						116,543

d. Works Cost

Item	Works details	Amount(\$)	Justification
Sub-total on works cost :		0	

e. General Expenses

Item	Amount(\$)	Justification
Sub-total on general expenses :	0	

f. Contingency

Item	Amount(\$) (Round down to the nearest integer)
Works contingency	0
General contingency	4,342
Sub-total on contingency :	4,342

g. Audit fee

	Amount(\$)
Audit fee	5,000
Sub-total on audit fee :	5,000
Total amount of funding sought :	154,100

3. Expected Project Outcomes

3.1 Deliverables/positive impact on the school's development

Item: Students' work

- 1) STEAM Exhibition—A STEAM exhibition on the smart farm (Activity 9) will be held on International Fun Fair Day. It will engage both parents and students in the production of ornaments and souvenirs from real flowers grown on the smart farm.
The exhibition will feature green technology / innovative new features/ green produces growing from Smart Mobile Farms
- 2) Lesson Plans of the school-based junior form STEAM Curriculum will be produced with reference to the smart farm learning activities. This will further enrich our school-based STEAM Learning Module in key areas such as “Innovation and Technology”, “Engineering Practices” and “Data Processing” in a smart farming context.
- 3) Presentation slides will be produced for the school-based STEAM Learning Module in key areas, including “Innovation and Technology”, “Engineering Practices” and “Data Processing” in a smart farming context.
- 4) Lesson worksheets will be produced for the school-based STEAM Learning Module in key areas, including “Innovation and Technology”, “Engineering Practices” and “Data Processing” in a smart farming context.

3.2 Evaluation

Evaluation Method: Questionnaire

The project will be evaluated through observation, questionnaire surveys, group interviews and students' performance in the mobile farming project.

Success criteria:

1. Assessing the effectiveness of the STEAM education project for junior secondary students, where success is defined by 70% of teachers and students acknowledging the project's role in advancing STEAM Education within the school.
2. Stimulating interest in learning among students, with success determined by 70% of teachers and students recognizing the project's effectiveness in increasing student interest in STEAM education.
3. Enhancing students' creativity, teamwork, and problem-solving abilities, with success measured by 70% agreement among teachers and students that the cross-disciplinary project fosters these skills.
4. Improving the professional skills of teachers, with a success indicator of 70% of teachers agreeing that the project boosts their confidence and understanding in teaching STEAM related subjects.

3.3 Sustainability of the project (only applicable to applications with total funding sought exceeding \$200,000)

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3.4 Dissemination (only applicable to applications with total funding sought exceeding \$200,000)

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When writing this proposal, did the school refer to the sample proposal/project(s) approved with funding support at the Quality Education Fund (QEF) website? Yes

4. School's Commitment

- 4.1 For the installation of a Smart Mobile Farming System, our school will consider the load of equipment. Meanwhile, our school will inspect the equipment regularly and be responsible for its maintenance. Our school will consult relevant qualified persons for professional advice, if necessary.
- 4.2 Our school ensures the Smart Mobile Farming System is hygienic and safe.
- 4.3 Our school ensures that all procurement of goods and services is conducted on an open, fair and competitive basis with measures taken to avoid conflict of interests in the procurement process.
- 4.4 Our school understands that the expenditure items funded by the QEF is one-off. Our school is required to bear the recurrent expenditure incurred, including maintenance costs, daily operating costs, etc., and the possible consequences that may arise.
- 4.5 Our school ensures that learning and teaching materials are developed to meet students' learning needs, levels, ages, and abilities. Moreover, the content and information will be correct, complete, objective, and impartial.
- 4.6 Our school acknowledges the acceptance of the QEF Intellectual Property Rights Policy and ensures that the deliverables shall not infringe any copyright or other intellectual property rights of any third party.
- 4.7 Our school confirms that the copyrights of the deliverables/materials developed should be vested with the QEF. Any reproduction, adaptation, distribution, dissemination, or making available of the deliverables to the public by the service provider(s) for commercial purposes is strictly prohibited.

5. Assets Usage Plan

Category	Item / Description	No. of Units	Total Cost	Proposed Plan for Deployment
Smart mobile farm	1. Smart Mobile Farm enclosed environment infrastructure - \$32,000 2. Modular sensor box for urban farming environment - \$28,000 3. Cloud-based remote control and monitoring system - \$19,500 4. Business intelligence software module for data analysis - \$15,000 5. Software upgrade to technology programming compatible - \$22,043	1	\$116,543	All these items will continue to be used after the completion of the project.

6. Report Submission Schedule

The school commits to submit proper reports in strict accordance with the following schedule:

Project Management (Should be submitted via the “Electronic Project Management System” (EPMS))		Financial Management (Hard copy together with supporting documents should be submitted to the QEF Secretariat by mail or in person)	
Type of report and reporting period	Report due on	Type of report and reporting period	Report due on
Progress Report 01/10/2024 - 30/09/2025	31/10/2025	/	/
Final Report 01/10/2024 - 28/02/2026	31/05/2026	Final Financial Report 01/10/2024 - 28/02/2026	31/05/2026