

U-STEMist Education 03

Exploring endless-possibility through coding and programming

Project introduction

As with the rapid growth of demand for interpersonal and analytical mindset, which makes the STEM becoming prevalent in the education aspect.

Therefore, our project is aiming at exploring endless-possibility through coding and programming, in which our emphasis place on micro-bit, to teach and illustrate basic coding skills, design and create several innovative programmings.

Design rationale

As Micro:bit providing a user-friendly which is by clicking and pasting the button in order to establish a function, we believe that it is understandable for the primary student. The reason to introduce if-condition to the student is that it plays a elementary roles in majority programming language, such as C++. We believe that by implementing the teaching of if-condition, which would provide them a clear idea of understanding the logic.

Apart from the theoretical teaching, several application tasks like pedometer and alarm system are set for the primary students. In the process of application, students would think all the knowledge and techniques once again, and have to attempt to apply those techniques.

Organizing Workshops

1st Workshop: Revise the knowledge - Micro:bit

We revise the basic knowledge because:

1. Want to make a further development on Micro:bit
2. Connect to the next workshop

In the workshop, we :

1. Raise different questions to stimulate students to think
2. Ask students to explain their coding
3. Modify the concept and teach the better way of coding
4. Inspire students to make improvements on the pedometer

2nd Workshop: Crime Prevention! - Making a BBC micro:bit alarm

We teach the burglar alarm system because:

1. Easy to make
2. Prevent valuables from stolen in daily life

The set-up is made up with:

- Detecting the movement in Z axis (up and down) by micro:bit

Once it has detected:

1. A warning showing on micro:bit
2. Buzzer will alarm

After the set-up, we inspire students:

1. Possible improvements for the set-up
2. Importance of learning this set-up
3. Further applications in various alarm systems



Limitation and difficulties

Although our target students have gone through several micro:bit introductory lessons, it is noticeable that not all the students could realize the ideas. For instance, in the pedometer application section, given our team members have given hints to the students, however they have no idea how to kick-start the coding. Meanwhile, several students with the background information could easily complete the tasks. It reflects the different level of understanding to the coding and the logical flow.

Individual reflections

Michael Kong: As a non-education major student, the project provides me a all-rounded full picture of how to be a teacher. Everything is new and fresh for me. It also leads me understanding the value of a teacher and to be a role model for students.

Alan Au: As a prospective teacher, this project broaden my horizon in STEM aspect. Since the project provided me to experience in learning, designing and practicing about STEM. The project allow me to have the first step of learning STEM.

Katy Chan: Being a General Studies prospective teacher, this project provides an opportunity for me to arrange a STEM activity. Designing, teaching and practicing in school would be an unique experience for me. Not only building my knowledge and understanding, but also the confidence to lead STEM.

Michael Kwok: This project provides me a precious opportunity to recognize the development of STEM education in primary and secondary schools. It also offers me a treasurable and unforgettable experience to have a taste teaching the primary school students.

Annisa Wong: Participating in this project boardens my experience in STEM education and consolidates my knowledge and pedagogical strategies in teaching STEM-related activities. Through both participating and organizing workshops, I realized the importance of diversity catering and the role of teacher.

Anna Tam: As a pre-service teacher, participating in the project allows me to have a in depth understanding of STEM education , especially in teaching micro:bit. Through arranging the workshop, I know more about the objectives of teaching and learning STEM related knowledge.

Conclusion

Overall, we have achieved:

1. Instruct students to write and apply simple coding techniques
2. Instruct students to construct a simple set-up with micro:bit
3. Inspire students to appreciate the use of micro:bit in daily situation

Recommendation

1. Review previous concepts and techniques with the students - consolidate and reinforce students' previous knowledge and facilitate application of concepts to this lesson.
2. Give an overview of daily-life applications before making the micro:bit product - arise student's interest, show the value of the product in our daily lives.
3. More pictures and detailed steps shown - make the content easier to be understood by primary students.