

**The 7th UNESCO UNITWIN
International Conference on Quality Teacher Education 2023
Mahidol University , Thailand**



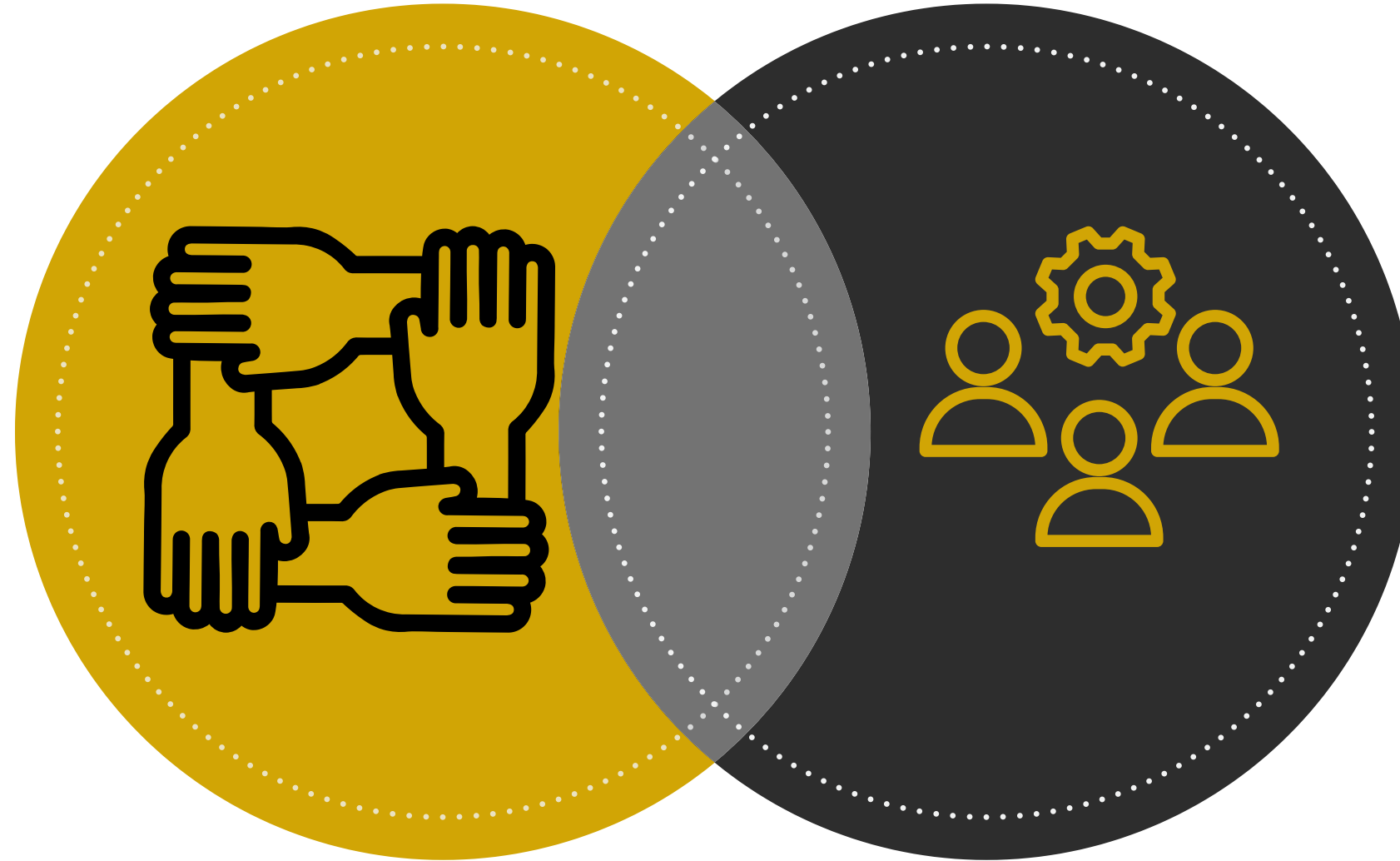
Invent an App Learning Sessions: Empowering Girls in STEM

Monalisa T. Sasing, Ph.D
Deputy Director for Research and Extensio
University of the Philippines
National Institute for Science and Mathematics Education Development
mtsasing@up.edu.ph

Objectives

Equip

To equip girls with the knowledge and skills in developing their own applications using block-based coding.



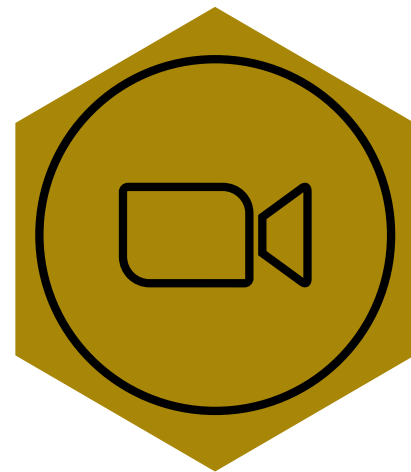
Empower

To empower girls in STEM

Delivery Modalities of the Remote Learning Sessions

Zoom

The 16 2-hour synchronous sessions were conducted online via Zoom.



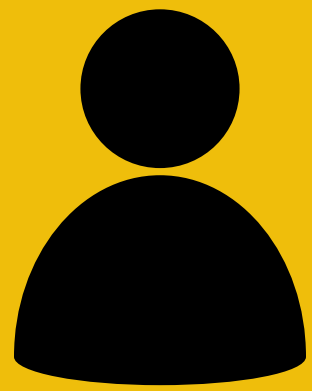
Google Classroom

Asynchronous activities were delivered via the Google Classroom after each synchronous sessions



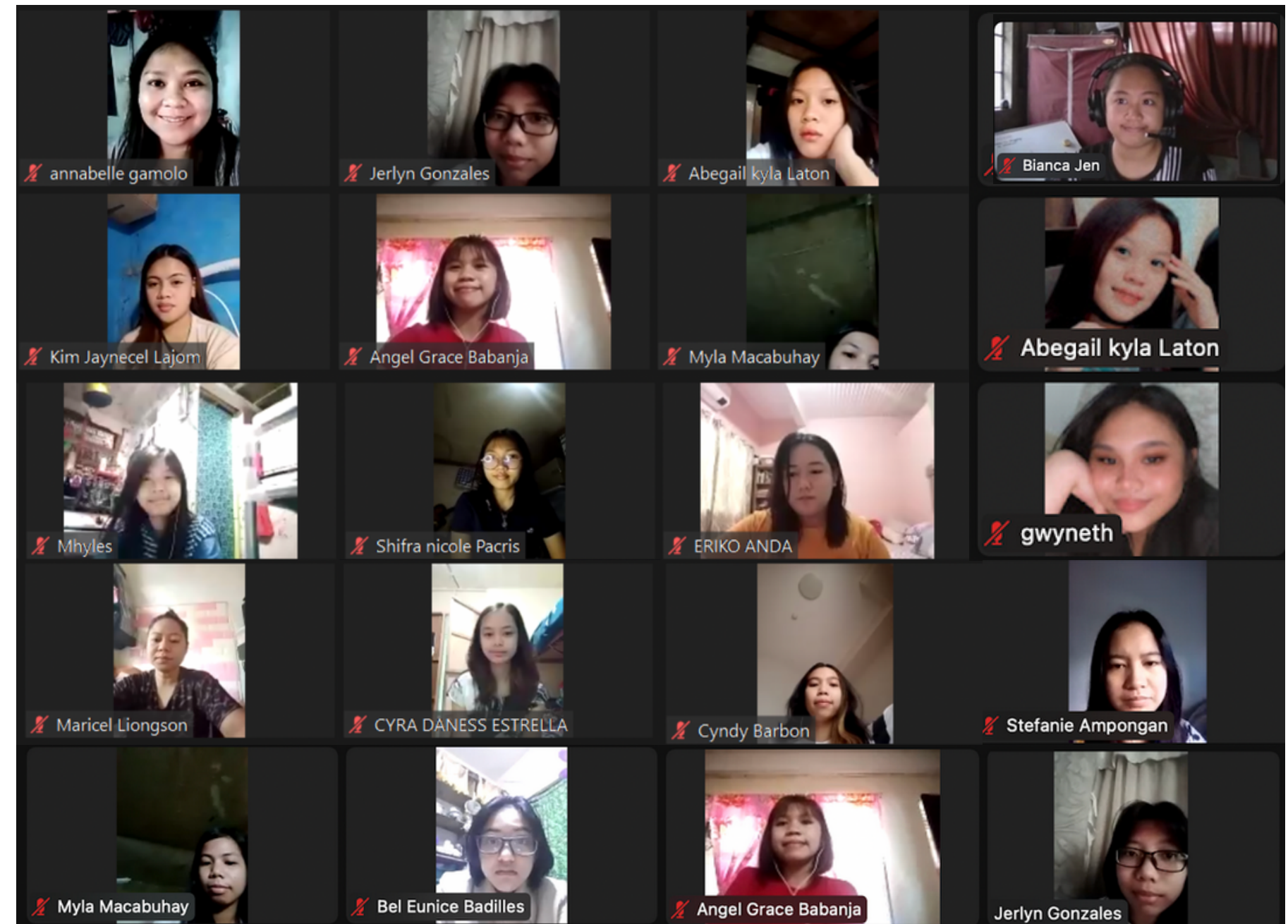
Recording of Synchronous sessions

Synchronous sessions were recorded and shared via the Google Classroom as a resource

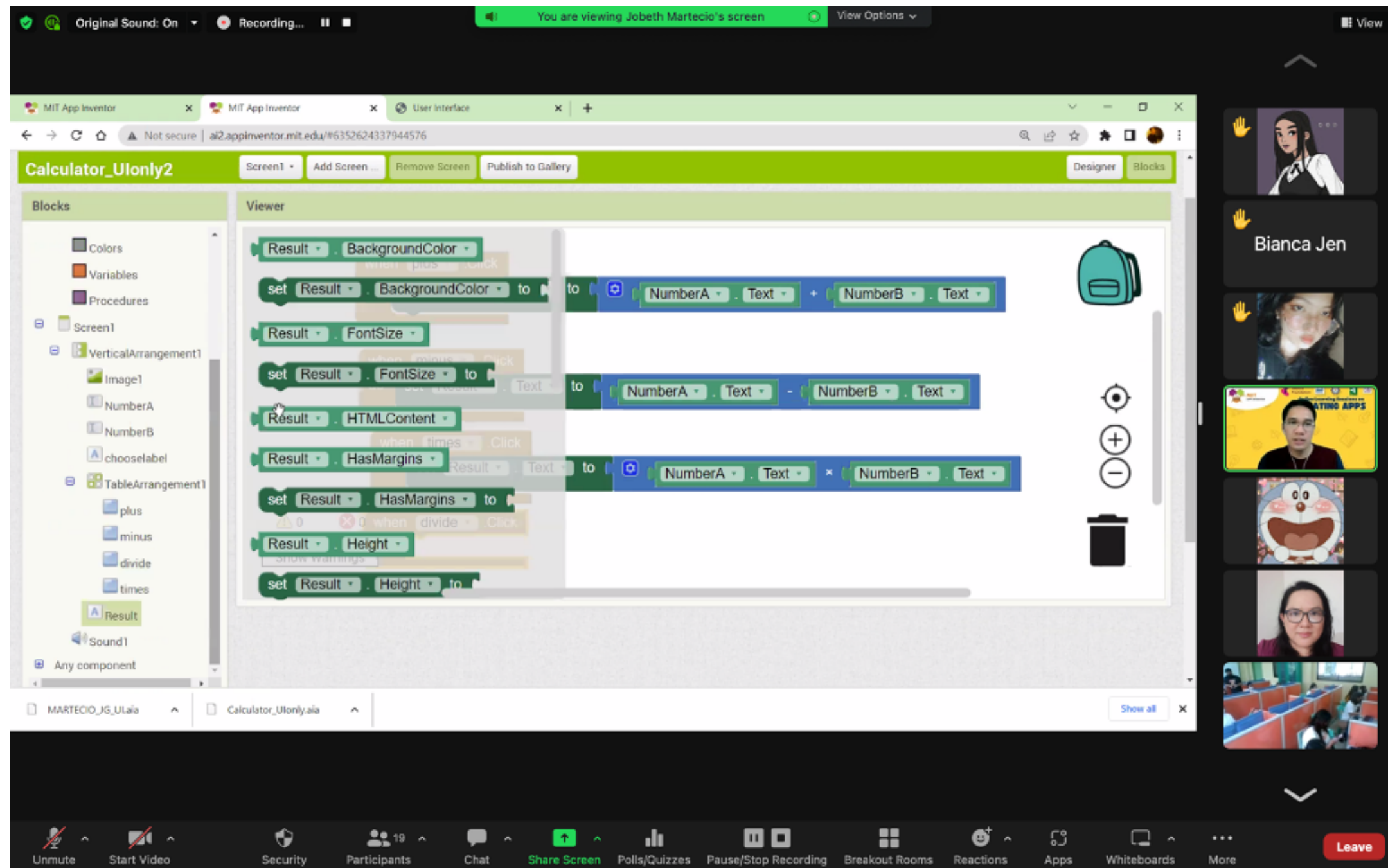


Profile of Participants

- 20 female ICT-track senior high school students of a secondary school;
- 19 Grade 12 students and 1 Grade 11
- Age ranged from 16 to 35 years olds with a mean age of 19.2 years.
- 16 (or 80%) had no background in block-based coding while 4 (or 20%) had some knowledge in programming (had little experience in using Java or HTML 5 basic).
- 4 ICT teachers



Learning Sessions



Students

- explored the how to use the MIT App Inventor; and
- learned block-based coding.


Learning Sessions

The screenshot shows a Zoom meeting interface. At the top, it indicates 'You are viewing John Alex Reyroso's screen'. The main window displays the MIT App Inventor web application. The interface includes a 'Blocks' panel on the left with categories like Lists, Dictionaries, Colors, Variables, and Procedures. The central 'Viewer' area shows a visual programming workspace with several event-driven blocks. For example, a 'when ClearButton .Click' block is followed by a 'do' block containing a 'set ClearButton .BackgroundColor' block. Another block shows a 'when ShowYourAgeButton .Click' event leading to a 'set TextLabelShowAge .Text' block that uses a 'join' block to concatenate text with values from 'SelectDatePicker2' components. The right side of the Zoom window shows a vertical list of participants, including one named 'Bianca Jen' with a Doraemon avatar. The bottom of the Zoom window features a control bar with icons for Unmute, Start Video, Security, Participants (27), Chat, Share Screen, Polls/Quizzes, Pause/Stop Recording, Breakout Rooms, Reactions, Apps, Whiteboards, and a red 'Leave' button.

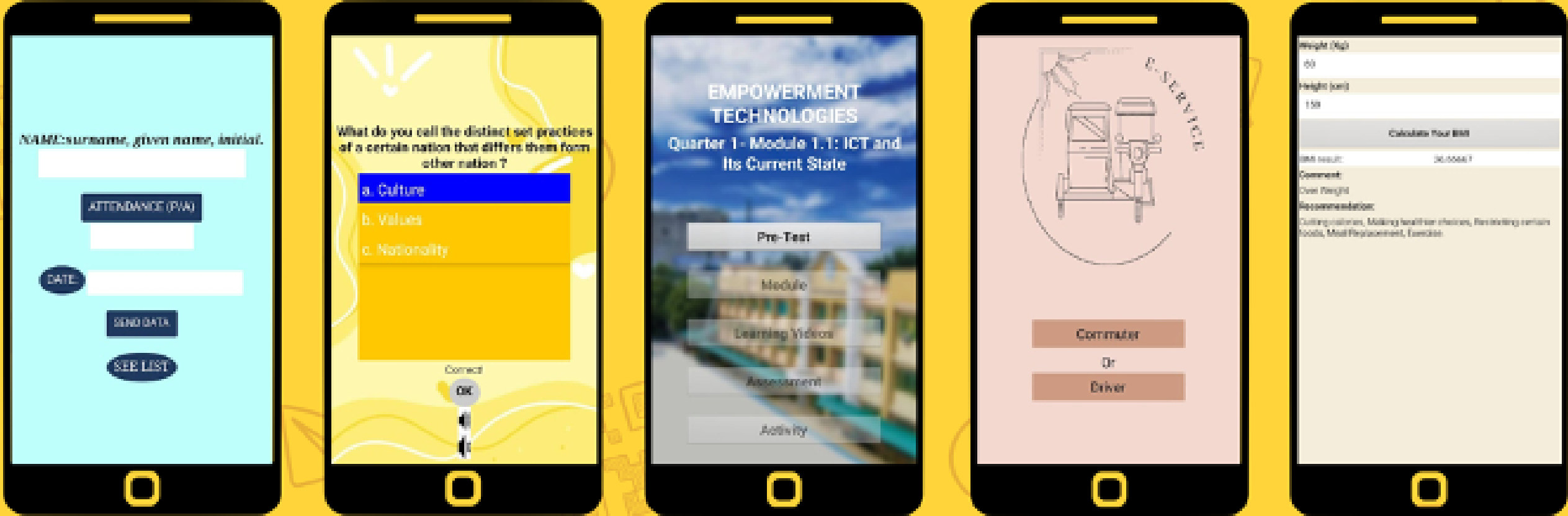
Students

- planned their own app that provides solution to a community problem; and
- developed their own app.

The Apps



MIT APP INVENTOR




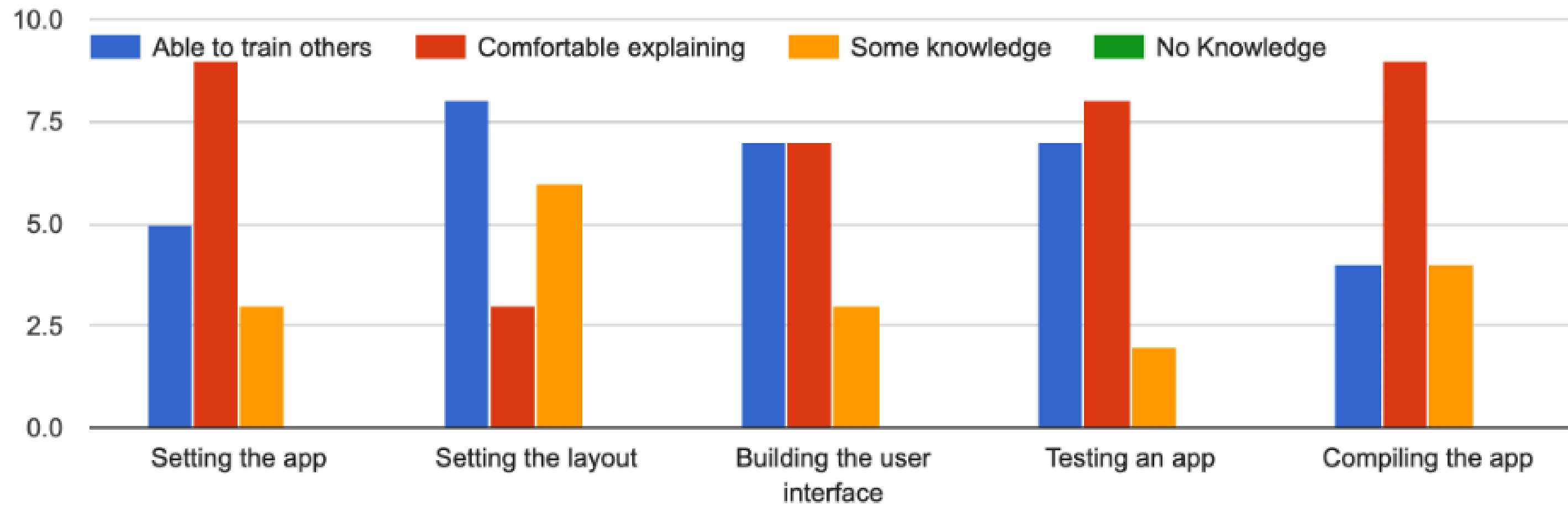
The image displays five smartphone screens, each showing a different application interface:

- Screen 1 (Attendance):** A form for recording attendance. It includes a text input field for "NAME: surname, given name, initial.", a button labeled "ATTENDANCE (P/A)", a "DATE:" label, and buttons for "SEND DATA" and "SEE LIST".
- Screen 2 (Quiz):** A quiz interface with the question "What do you call the distinct set practices of a certain nation that differs them from other nation?". It offers three multiple-choice options: "a. Culture", "b. Values", and "c. Nationality". A "Correct" message and an "OK" button are visible at the bottom.
- Screen 3 (Empowerment Technologies):** A menu for an educational module titled "EMPOWERMENT TECHNOLOGIES" and "Quarter 1- Module 1.1: ICT and Its Current State". The menu items are "Pre-Test", "Module", "Learning Videos", "Assessment", and "Activity".
- Screen 4 (E-SERVICE):** An interface for an "E-SERVICE" featuring a diagram of a service process and two buttons: "Commuter" and "Driver".
- Screen 5 (Calculator):** A utility application for calculating a bill. It has input fields for "Weight (kg)" and "Height (cm)", a "Calculate Your Bill" button, and a display area showing "Bill result: 30.00000", "Comment:", "Over Weight", and "Recommendation: Cutting calories, Making healthier choices, Revisiting certain foods, Meal Replacement, Exercise".

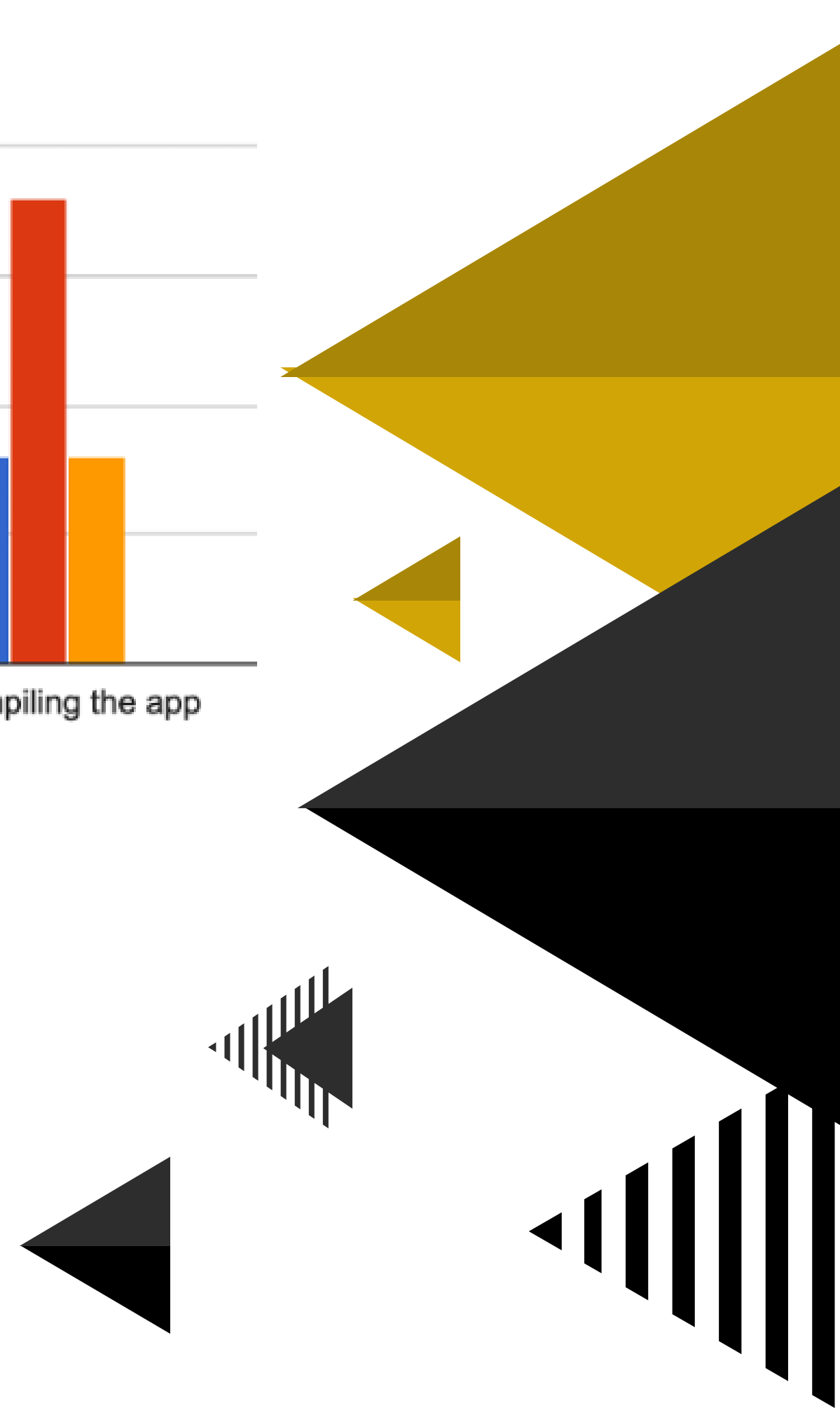


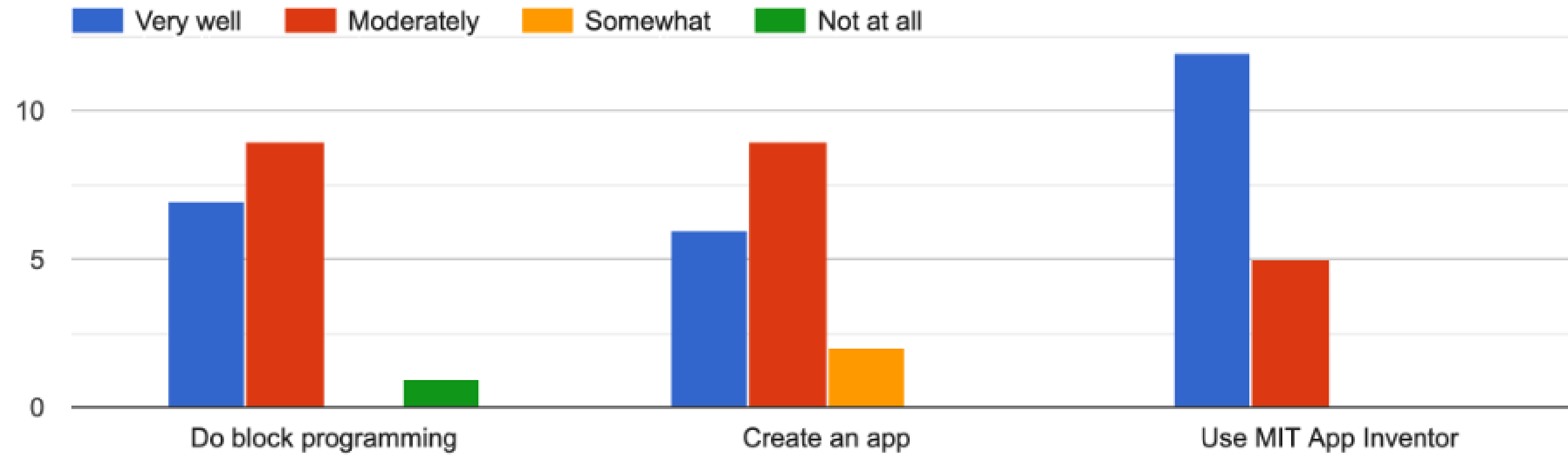
Telstra Foundation PBSP UP NISMED FPSMER

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- Overall results of the pretest and posttest of participants' knowledge and skills related to the specific topics of the learning sessions showed significant improvement, with t-value equal to 4.732 and $p = 0.0006$.
 - Participants' mean pretest score was 9.91 and their mean posttest score was 14.25.



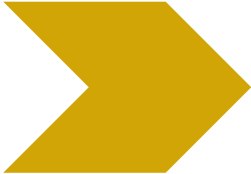
Distribution of participants by their self-report level of knowledge and skills in creating apps after the training.



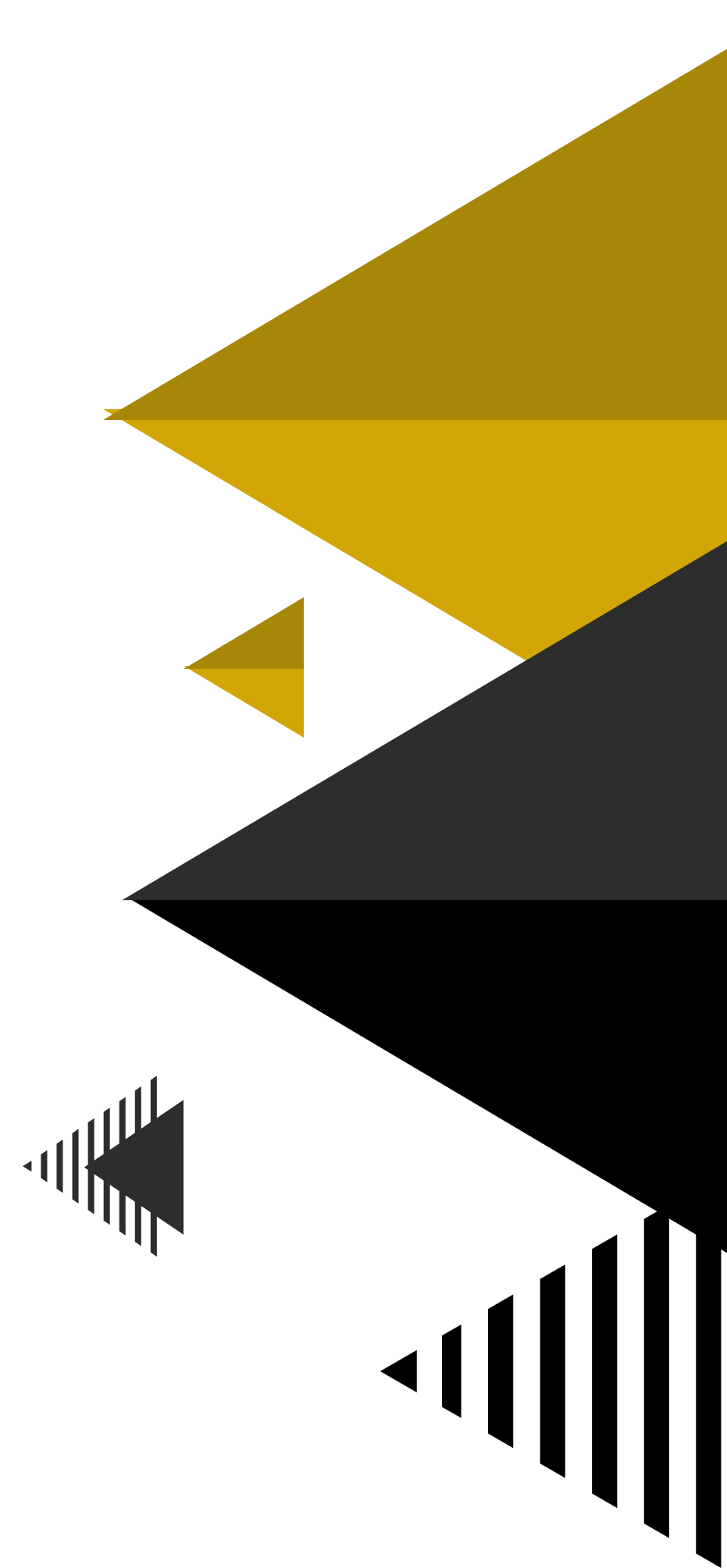


Distribution of participants by their preparedness to do block programming, create an app, and use MIT App Inventor after the training.





Verbatim feedback showed that the students were grateful and happy that they have joined the training as it helped them validate interest to pursue an ICT course in college.



Recommendations

Training Duration

Increase the duration of the learning sessions to 30 hours. This will enable participants to master the block coding skills they have gained from the training.

Reinforcement of the Skills

- Provide more video tutorials to participants which they can refer to when reviewing the activities they did during the learning sessions. These are good resources that they can use when they practice to do block programming and practice using the MIT App Inventor.
- Conduct a follow-up or enhancement training to participants who performed well during the first batch of learning sessions. This is to sustain the interest of the participants and to help them further enhance their coding skills.

Assessment

- Assess the computational thinking of students.



Thank You.

