Teaching robots to dance

Annotation

The students break down a familiar process into a set of precise and unambiguous instructions. They articulate these instructions, identify where they have made mistakes, and correct the instructions.

Background

As part of health and physical education, students have been learning names of body parts, practising movement skills, and developing their awareness of space around their bodies. This has included learning the song "Heads, shoulders, knees, and toes" and its associated actions.

Task

The teacher, Ms Sinclair, asks the students to teach "Heads, shoulders, knees, and toes" to a robot. She explains that computers can only understand specific, simple instructions. So to teach a robot to do something, the task has to be broken down. The students will have to think carefully about the song and its actions and break them down into clear steps.

To help the students with their instructions, Ms Sinclair offers to pretend to be the robot.

Health and physical education provides a meaningful context for this computational thinking task. The task also provides an opportunity for students to work together to achieve a particular purpose.

Student response

Ms Sinclair:	*What's the first thing you need to tell the robot to do?*
Ani:	*You go "Heads, shoulders …"* (starts singing the song and doing the actions)
Ms Sinclair:	(in a pretend robot voice) *I don't understand.* (in her normal voice) *How would you explain the first thing you're doing?*
Ani:	*First you do this.* (puts her hands on her head)
Ms Sinclair:	*Can you describe exactly how you do that?*
Ani:	*You put your hands on your head.*
Ms Sinclair:	(puts her hands on her head)
Oliver:	*And then you sing, "Heads".*
Ms Sinclair:	(puts her hands on her head and sings "Heads") *That's right! What should I do next?*
Petra:	*Now you do this.* (sings "shoulders" and puts her hands on her shoulders)
Ms Sinclair:	(in pretend robot voice) *I don't understand.* (in her normal voice) *Could you explain exactly how I do that?*
Petra:	*You put your hands on your shoulders, and then you sing "shoulders".*
Ms Sinclair:	(puts her hands on her shoulders and sings "shoulders"). *Great! Now what do I do next?*
Hone:	*Now you put your hands on your knees and sing "knees".* (all students do this together)
Hone:	*Then you put your hands on your feet and sing "and toes, knees and toes, knees and toes".* (teacher puts her hands on her feet and leaves them there the whole time while singing "and toes, knees and toes, knees and toes")
Hone:	*No! You put your hands on your feet and sing "and toes", then on your knees and sing "knees", then back on your toes and sing "and toes".* (teacher does this)
Ms Sinclair:	*Great! Now let's start from the beginning. Can you give me all the instructions, one by one, as we do the song?*

MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA