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NATIVE AMERICAN HERITAGE MONTH

Danielle Boyer

Wearable Robots for Language Revitalization

Engineering Access, One Kit at a Time

Danielle Boyer is Ojibwe, a member of the Sault Ste. Marie Tribe of Chippewa Indians. She began teaching science to younger kids at age 10. As a teenager she watched her younger sister get priced out of a robotics team that cost hundreds of dollars to join, and she started designing robots that were cheap enough to give away. In 2019, at 18, she founded **The STEAM Connection**, a nonprofit that sends free robotics kits to students, especially Native youth.

Her low-cost robot EKGAR — "Every Kid Gets A Robot" — costs under \$20 in parts. Her robots are **3D-printed** from recycled plastic, which keeps them affordable and easy to repair or remake.

Her best-known invention is the **SkoBot**, a robot worn on the shoulder that helps students learn **endangered** Indigenous languages. It uses **speech recognition**, a narrow form of artificial intelligence that Boyer built and trained herself. The robot listens for a specific voice cue, matches it to a word it has been trained on, and then plays a recording of a fluent speaker saying that word or phrase. The SkoBot does not invent sentences — the language always comes from real speakers.

Boyer teaches Native students to assemble and program their own SkoBots, so the students are building the technology, not just using it. Her work has been featured by NPR, ABC News, and the Lemelson Foundation.

Part 1 • Reading Comprehension

1. What experience led Boyer to focus on making robotics affordable?

2. Explain, step by step, what happens when a student gives the SkoBot a voice cue.

3. Why is it important that the SkoBot plays recordings of fluent speakers instead of generating its own sentences?

4. Why does Boyer teach students to build and program SkoBots instead of just handing them finished robots?

Part 2 • Critical Thinking

Speech recognition is called "narrow" AI because it does one specific job. Name one advantage and one limitation of a robot that only recognizes a small set of voice cues.

Part 3 • STEM Challenge

Kit Math

Suppose a classroom wants to build robots like Boyer's. An EKGAR-style robot costs about \$18 in parts. A 3D printer uses about 60 grams of recycled plastic per robot body, and a 1 kg spool of plastic costs \$20. Show your work.

1 How much would parts cost for a class of 25 students, one robot each?

2 How many robot bodies can be printed from one 1 kg (1,000 g) spool?

3 How many spools does the class need for 25 robot bodies?

4 A commercial robot kit costs \$250. How much money does the class save by building 25 low-cost robots instead?

