LEGO WEDO 2.0 ROBOTICS PILOT FOR TEACHERS

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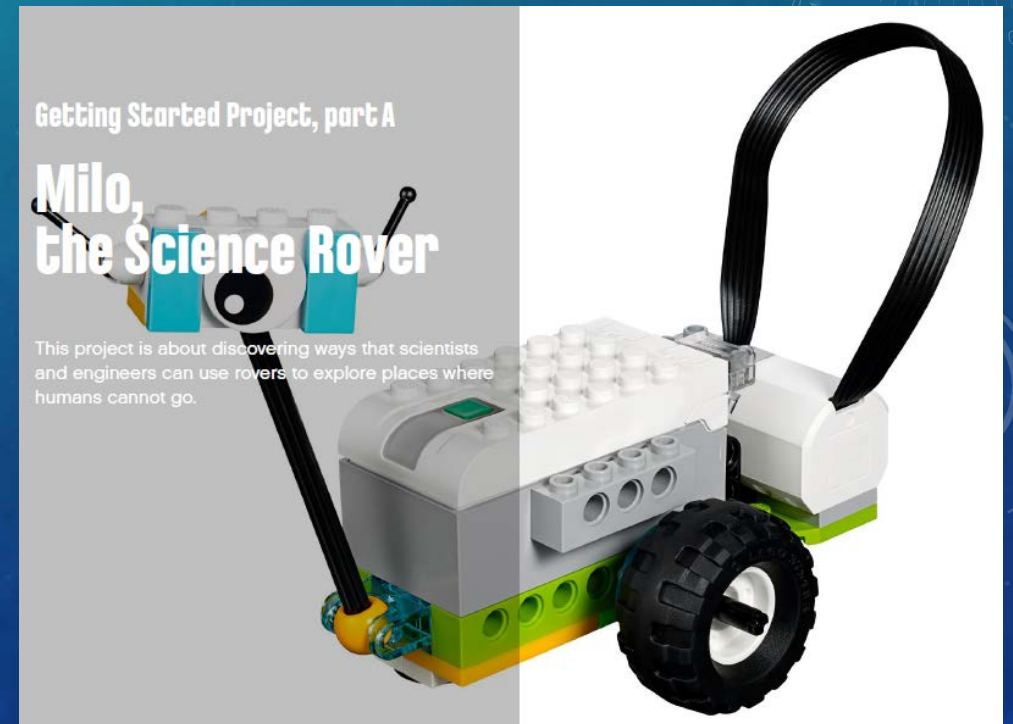THE UNIVERSITY OF TENNESSEE AT CHATTANOOGA

BACKGROUND

- Previous work with Lego WeDo and Lego Mindstorms NXT

- Future work with Lego Mindstorms EV3

- Member of Lego Education Ambassador Program (LEAP)

WORKSHOP

- June 27-29, 2016
- Four teachers, in-service and pre-service
- Completed Lego-suggested projects
- Completed some of the open-ended projects
- Kit allows students to model reality, investigate, and design
- Projects aligned with NGSS, grades 2-4 (K-5)

GETTING STARTED PROJECTS

- Four projects
- Milo, the science rover
- Similar to NXT, rather than earlier WeDo
- Motion and tilt sensors

Getting Started Project, part A

Milo, the Science Rover

This project is about discovering ways that scientists and engineers can use rovers to explore places where humans cannot go.

GUIDED PROJECTS

- Eight projects
- Physical science and biological science
- Examples: Pulling, Frog's Metamorphosis
- Incorporate science with the building activities

OPEN PROJECTS

- Eight projects

- No building instructions, rely on structures from other projects

- Examples: Wildlife Crossing, Moving Materials

ASSESSMENT

- Lego, teacher-led assessment of students
- Observation rubric for Explore, Create, and Share
- Concentration on Create
- Four levels: Emerging, Developing, Proficient, Accomplished
- Participant self-assessment

RUBRIC AREAS

- Explore: I documented and used my best reasoning in connection with the question or problem.

- Create: I did my best to solve the problem or question by building and programming my model and making changes when needed.

- Share: I documented important ideas and evidence throughout my project and gave my very best when presenting to others.

RESULTS FOR "CREATE"

- One participant: Self-assessment of Accomplished
  - Tried to think of ways to take each design to the next level
  - Worked independently of instruction guide, after learning basic structures

RESULTS FOR "CREATE" (CONTINUED)

- Three participants: Self-assessment of Proficient
  - Understood what was built and able to modify
  - Comprehended content and concepts; needs to improve application [on open-ended projects]
  - Easily followed instructions; did not fully master open-ended activities to create something original

PARTICIPANT PROJECT REFLECTION

- Things done well
  - Innovate – make designs their own, create new designs
  - Follow directions on guided assignments (2)
  - Stayed organized, analyzed problem areas, fixed problems

PARTICIPANT PROJECT REFLECTION (CONTINUED)

- Things to improve upon
  - Develop the ELA part, rather than, just, the engineering part
  - Practice creating own designs with, both, bricks and programming
  - Modifying designs for different situations
  - Learn more about kit components, and when and how to use them

CONCLUSIONS

- Guided projects were easy to build, program, and comprehend.

- Additional time should be devoted to learning about the functions of kit components.

- Develop a sample organizational plan for approaching an open-ended project.

- Place an emphasis on cross-curricular learning, especially in ELA.