Summary from the **Collaboration** Development Lab

LEGO® Engineering Symposium
- for MINDSTORMS Education
Monday, June 1st - Tuesday, June 2nd 2009

LEGO Engineering for Girls:
Building a diverse learning environment with LEGO Robotics
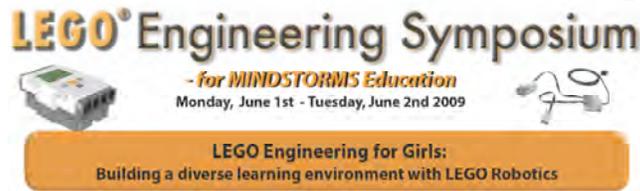
We made representations of *collaboration* (see attached)

Discussed a collaborative activity:

❒ The Infinity Loop
- o Small groups (4-6) are responsible for moving a ping pong ball through their 1x1m space
- o Each small group must collaborate with a group before and after them to assure that the ball continues
- o Numerous groups work together so that the ball travels the length of a room sized infinity loop


Ideas we explored:

❒ Building models that show how collaboration is needed to solve environmental issues with natural resources (wind, water, and solar energy transfer devices)

❒ Collaborating by assigning changing roles throughout the design and construction of the project

- Building robots that collaborate by greeting each other (within single classroom, and across classrooms and schools)
  - Collaboration working with other teams to coordinate "hi-fives", discussions, etc.
- Experimenting with proportionality through the use of different sized wheels for "front end" and "back end" of robotic car – to enable the car to move forward, the "front end" designer and "back end" designers needed to collaborate on the programming
- Collaborating through the design of "robotic soccer legs": two legs that would kick ball back and forth between each other
- Using WeDo hardware to enable collaboration between different grade levels – high school and/or middle school youths working with elementary school youths.
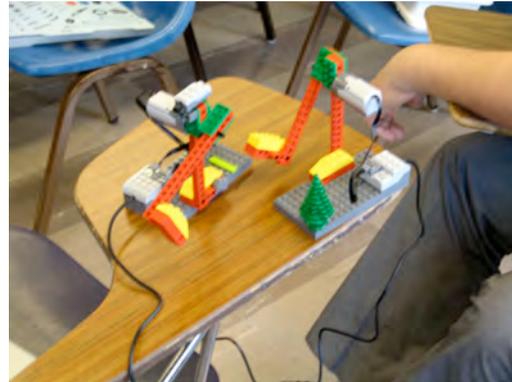
Insights we gained:

- Female / male collaboration was quite natural and evident through exploration of MINDSTORMS hardware and software.
- Collaboration goes beyond small independent "group" assignments.
- Large-scale collaborations might require smaller teams to contribute to an overarching greater goal. Achievement of the goal is dependent on each individual team's contribution. We might call this "multi-group collaborative learning."
- We all have valuable ideas about what constitutes true collaboration ("Collaboration Sketches" follow).