LEGO WeDo and NXT Tech Tips – John Heffernan

Teachers, especially classroom teachers who are implementing a robotics unit in their classroom, may not have much troubleshooting experience and may not have ready access to tech support. As a former electrical engineer and computer scientist, I have found that many troubleshooting techniques we use are not known to the public at large.

BeeBots

1. Shut off after use to save the batteries.
2. You can turn off the power to stop a really long program from running.
3. Remind kids often to Clear before starting a new program.
4. Change the batteries if you are having trouble with a particular BeeBot.
5. Clean wheels if the BeeBot is not going straight.
6. Try a different, smoother surface if the BeeBot is not moving well.

WeDo

1. Use the Activity Guide if students need a programming model for a particular LEGO robot.
2. If the Activity Guide icon is greyed out, replace the INI file in Users/Shared/Lego Creations/WeDo. For a good file, see http://kidsengineer.com/wp-content/uploads/2011/08/WeDo.ini_.zip The file needs to be unzipped first. (Macintosh)
3. Use the Connections Tab in upper left hand corner of the WeDo screen. It shows what is connected (or not). Sensors will indicate if they are working if you move them.
4. Disconnect the motor from any gears if the motor appears connected but does not move. If it moves without being connected, something is jammed in the gears or other structure. If it does not move without being connected, try a different motor.
5. Try different USB Hub, motor, or sensor if they do not appear to be working. If it does work, that piece is likely faulty. If the replacement also does not work, that piece is not the problem.
6. Click all connectors into position. This is frequent cause of many problems.
7. For Start on Keyboard Press icons that are not working correctly, add and click on a simple Start block and Motor This Way program to get the Start on Keyboard Press working again. We have seen this when there are multiple programs that start with the same key.

NXT

1. Turn off robot educator or use the patch if NXT-G (the programming interface) is running very slowly (Macintosh)
2. Delete memory using the NXT window if you get a error message saying the NXT is out of memory.
3. Lift up robot if you have movement problems to see what is going on with the wheels.
4. Don't use Bluetooth to download program, use the USB cables.
5. Make sure you are running the program you think you are. Check the display. The name should match the program name on the computer.
6. Hit the orange go button again if the robot does not start the first time.
7. If a block is just not doing what it is supposed do, delete it and start with a new block.
8. If the new block does not work correctly, try updating Firmware on the NXT and download the program again to test it.
9. If that does not repair the problem, save the program, shut down the computer and the NXT and after they are restarted again, try downloading the program and testing it again.
10. The sound sensor can hear the robot car's own motors. Increase the threshold or turn up to 100 and try in a quiet place.
11. Make sure the connections to motors/ports match the programming interface.
12. If the robot appears to dead, first try known good batteries. If it still appears dead, reset the unit by pressing a paper clip for 10 seconds into the hole under the USB port and try again.
13. Unlimited in the motor block duration field will not go forever by itself. Surround it with a repeat block if you wish an indefinite time.
14. The degrees duration in the motor block will do turn a robot car *x* degrees. It will rotate a motor *x* degrees. I always have students use seconds and figure out, by trial and error, the duration to power one motor to turn *x* degrees.
15. If a "Communication lost with NXT" error message appears when attempting to download a program to the NXT, unplug the USB cable from the computer and plug it into a different computer port.
16. Common failures for not driving straight are bent axles, tires not seated on the rims properly, and robots that have more weight on one side.

NXT and WeDo Tips

1. Write a simple program and try that if a complex program is not working.
2. Build on a program that works, test often and add to it. Don't start with a really complex program.
3. Make sure all LEGO pieces are clicking in firmly. Many robots will be wobbly or will not work in other ways if pieces are not clicked in firmly.

4. Compare a robot that is not working with a working model if there are possible construction issues.
5. Recheck directions and compare the model with the book if there are possible construction issues.
6. In general, always try to isolate the problem. Is it software? Hardware? What is working?

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