INQ-ITS
Dr. Janice Gobert, jgobert@wpi.edu

Digital science inquiry assessments to support teachers’ instruction and students’ learning

Inq-ITS (Inquiry Intelligent Tutoring System) is an online educational environment for science. Students conduct inquiry using virtual lab simulations aligned with NGSS standards for Physical Science, Life Science, and Earth Science; the system hones students’ scientific inquiry skills and provides educators immediate formative metrics on their students for these skills. Unlike other online labs, Inq-ITS uses computer science-based algorithms that automatically assess and tutor students’ authentic inquiry skills including hypothesizing, experimenting, analyzing data, etc. Help is given by a pedagogical agent, a cartoon figure that provides support when it detects a student is off-track. The system generates reports for educators on each inquiry skill, summarizing individual student and classroom-wide performance. In brief, while students “show what they know”, educators get real-time, actionable data they can use to tailor their instruction.
① Inquiry starts by forming a testable hypothesis
All Inq-ITS activities have a similar look-and-feel to guide students through the inquiry process: hypothesizing, collecting data, analyzing their data, and communicating.

② Students design and run their own experiments, collecting data to test their hypothesis
Inq-ITS uses data-mined models to determine, for example, when students do not design controlled experiments or collect data to test their hypotheses, important inquiry skills.

③ Automatic assessment reports allow educators to see trends in their classroom and identify struggling students
Inq-ITS’ real-time assessment enables teachers to quickly tell how the class is progressing, and how each individual student is progressing, on each inquiry skill and sub-skill.

④ Real-time alerts help educators focus their efforts when and where it matters most
Since timely feedback is critical to deep learning, a mobile alert system is being developed for teachers’ smartphones and tablets so they will always know who needs help the most, and on which specific inquiry skills.