MOSART HS LS
Misconception Oriented Standards-based Assessment Resource for Teachers of High School Life Science
DBK-12, 1316645, http://mosart.smpnet.org
Harvard-Smithsonian Center for Astrophysics, Cambridge, MA

6. HS LS Gain Study
Administering pre- and post-test to high school LS students and their teachers, we were able to generate 6760 student gains for the classrooms of 87 teachers. The effect size (gain in units of SD of the pretest scores) were highest for evolution and lowest for herdity subscores.

Sample Item: LS1.A.1_0808
The nucleus of a cell
- is defined by proteins and neutrons 9%
- has a positive charge 2%
- contains DNA 68%
- is defined by electrons 5%
- is located in center 17%

Item Gender Bias
- Bias
- no Bias

5. Instrument Construction
The resulting item parameters allowed the construction of unidimensional public and secure assessment instrument comprised of 29 items. Also, 6 additional items were added for extending item difficulty for teachers.

Flowchart of Item Inventory Development Process. We examine whether technological solutions can make the process more seamless and less costly.

4. Field Testing With High School Life Science Students and Teachers
There is no substitute for administering test items to the target audience. HS LS students, to establish item difficulty, discrimination, misconception strength, and gender bias. Items were administered in sets of 25 with 27 anchors common between the 22 forms to 9,740 students in the classrooms of 187 teachers (averaging 52 students/teacher).

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Item Characteristics
- Padj (easiness) = 0.68
- Discrimination = 0.48
- Misconception Strength = 0.53

Effect Size by Teacher

Performance on MOSART HS LS Assessments
87 teacher’s classrooms, 6760 students

Teachers showed a range in effectiveness as measured by the gains of their students.

Impact of Teacher SMK and PCK on Student Gains

Teachers with subject matter knowledge (SMK) and knowledge of student misconceptions (KOSM or PCK-M) had higher gains in their classrooms.