

Research Summary
**Findings and Implications of Recent ATI Research
Related to Arizona's College and Career Ready
Standards**



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Background Information: Arizona's College and Career Ready Standards (AZCCRS) in mathematics and English language arts (ELA) were adopted by the Arizona State Board of Education in 2010 and new statewide assessments aligned to these standards are planned for the 2014-2015 school year. Since 2010, Arizona school districts and charter schools have been transitioning curriculum and instruction to promote student mastery of AZCCRS and to prepare for new statewide assessments. Assessment Technology, Incorporated (ATI) supports implementation of AZCCRS through the Galileo® K-12 Online Instructional Improvement and Instructional Effectiveness System. The system is currently being implemented in 252 districts and charters serving more than 500,000 students throughout Arizona in grades kindergarten through 12. ATI recently conducted two research studies designed to provide information that can assist policy makers, districts, charters, parents, families, and other stakeholders during this transition period.

Research Brief - Progress by Arizona Students Toward Mastery of Arizona's College and Career Ready Standards: This study estimated the percentage of Arizona students attaining various percentile ranks within the ATI Arizona score distribution who are likely to show mastery of each of AZCCRS in math and ELA in third and eighth grade. The main findings and implications of this research are as follows:

- AZCCRS represent skills of varying difficulty. A high percentage of students at all levels of performance are likely to show mastery of easier standards. Only higher-performing students are likely to show mastery of more difficult standards.
- Arizona's higher-performing students scoring at or above the 85th percentile are well on their way to mastering the majority of AZCCRS. In contrast, Arizona's lower-performing students scoring at or below the 15th percentile are in need of additional instruction and intervention to increase mastery of AZCCRS.
- At all levels of performance, students have mastered some of AZCCRS but not others. Information about which standards students have mastered can be used to differentiate instruction and to guide remediation and enrichment.
- The relative difficulty of AZCCRS can inform the design of scope and sequence for standards aligned curricula. Information about student mastery of standards before and after instruction can help evaluate the effectiveness of curricula and instructional practices.

Research Brief - Comparison of Predictive Validity and Forecasting Accuracy for Assessments Aligned to Arizona's College and Career Ready Standards and Older Arizona Standards: This study evaluated predictive validity and forecasting accuracy with respect to the spring 2013 Arizona's Instrument to Measure Standards (AIMS) assessments for Galileo district/charter-wide assessments administered in the 2012-13 school year and aligned to either AZCCRS or the older Arizona State Standards in mathematics (adopted 2008), ELA (adopted 2003), and science (adopted 2005). The main findings and implications of this research are as follows:

- Both locally-designed Galileo district/charter-wide assessments aligned to AZCCRS and those aligned to older AZ standards demonstrated high levels of predictive validity and forecasting accuracy with respect to the AIMS assessment.
- Arizona students were ranked in a similar order by assessments measuring AZCCRS and older AZ standards. Student scores on Galileo assessments aligned to either set of standards were highly correlated with student scores on the corresponding AIMS assessment.
- Moderate to high correlations were consistently observed across different sets of standards, grades, and content areas. Variability in the correlations is within typical ranges and likely reflects variability associated with different samples of students.
- Galileo risk levels accurately forecast student AIMS performance based on student performance on multiple Galileo assessments aligned to AZCCRS and/or older AZ standards. Districts/charters can use local Galileo assessments to provide student risk levels along with information about student standards mastery supporting the planning of effective interventions.
- High levels of forecasting accuracy suggest that statistical procedures applied by ATI to align the performance level cut scores for Galileo assessments to those for AIMS were effective. These procedures are anticipated to be similarly effective in forecasting performance on the new statewide assessments once cut scores for those assessments have been established.

Next Steps for Practice and Research: The research described in this summary suggests immediate next steps for practice that can be implemented by districts/charters as well as future next steps for research.

- Districts/charters can benefit from administering reliable, valid, local assessments (e.g., benchmark assessments) that provide detailed information about student mastery of AZCCRS standards.
- Districts/charters can use empirical information about student standards mastery before and after instruction as well as empirical information about the relative difficulty of standards to optimize AZCCRS aligned curricula and instructional practices.
- Districts/charters can also use standards mastery information to plan differentiated instruction, remediation, and enrichment to promote mastery of AZCCRS by all students.
- Once performance level cut scores for new statewide assessments are available, research can be conducted to forecast student risk of failing to pass the new statewide assessments based on performance on local assessments. Districts/charters can use this risk information to identify students in need of additional instruction and intervention.
- Future research can be conducted to evaluate whether the performance of Arizona students has changed following the transition to AZCCRS and new statewide assessments. For example, once data from comparable student samples are available, research can be conducted to establish the relationship between student mastery of older AZ standards (as measured by passing the AIMS assessment) and student mastery of AZCCRS (as measured by passing the new statewide assessment).