

RUNNING HEAD: Criterion Validity of *A+nyWhere Learning System*®

**Criterion Validity of *A+nyWhere Learning System*®  
Reading Assessment: Grade 8**

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## **Criterion Validity of *A+nyWhere Learning System*® Reading Assessment: Grade 8**

### **INTRODUCTION**

The *A+nyWhere Learning System*® (*A+LS*) is a network-installed computer program that delivers core curriculum instruction to students ranging from kindergarten through adult learners. This educational software features integrated assessment and automated reporting tools that are aligned to all state and national academic standards and include extensive management capabilities. The system provides diagnostic assessments to determine a student's mastery level of instructional objectives and prescribes lessons to provide instruction in the objectives that have not been mastered. Due to the No Child Left Behind Act, one important aspect to scientifically establish is that the *A+LS* assessments are valid assessments of their specific academic content areas. In addition, there is a need to demonstrate that *A+LS* assessments are valid for specific demographic student groupings such as those based on ethnic backgrounds and gender. The method used in this paper is to investigate the magnitude of agreement (criterion validity) between a standard *A+LS* reading assessment and the reading portion of the Oklahoma Performance Index (OPI).

Criterion validity (or concurrent validity) describes the correlation between an instrument of interest and established standard measures. This means that investigations of criterion validity attempt to demonstrate that a new assessment for a given content area aligns both in direction and magnitude with well-established measures of that same

concept area. In this paper, the correlations between the reading portions of the OPI and a specific *A+LS* reading assessment for Oklahoma eighth grade students (including two sub-samples of eighth-grade students who are English Language Learners or enrolled in Special Education) are investigated to provide criterion validity evidence for the *A+LS* reading assessment.

### **Description of the Oklahoma Performance Index**

The Oklahoma Performance Index (OPI) is a set of scaled scores that are derived from the Oklahoma Core Curriculum Tests (OCCT). There is a direct one-to-one relationship between the OCCT number-correct score and the OPI: the students with higher number-correct scores receive higher OPIs. The OPI scores are based on percent correct scores but are reported on a scale of 400 to 990. This allows for OPI comparisons across school years.

The Grade 8 OCCT in Reading consists of 50 multiple-choice test items. These items are drawn from various genres including classic and contemporary literature, poetry, magazines, newspapers, reference materials, and online information. Students are asked to respond to a variety of items written to the standards of Vocabulary, Comprehension and Critical Literacy, Literature, and Research and Information. Each standard requires students to use a number of different reading skills. This assessment takes about 85 minutes; however, additional time is supplied as needed as this is not a timed test.

### **Description of *A+LS* software and assessments**

The *A+nyWhere Learning System*® is a network-installed computer program with extensive management capabilities. The system provides diagnostic assessments to determine a student's mastery level of instructional objectives and prescribes lessons to provide instruction in the objectives that have not been mastered.

Each lesson is presented with a consistent methodology. In essence, it is a computer-delivered lesson based on the principles of mastery learning. Throughout *A+LS*, illustrations are used to provide context and amplification of the concepts presented in print. However, graphics are not used to create a “game-like” experience. *A+LS* is designed so that it is clear to students that they are in a learning environment. In each lesson, a study guide that consists of a series of screens presents the concept being taught. The study guide is followed with a series of practice exercises in which students receive immediate feedback regarding the accuracy of their answers. Then, there is a mastery test. The management system provides ongoing feedback to students regarding their overall progress.

A key component of *A+LS* is its ability to assess students against specific standards and prescribe individual lesson plans for students based on their specific needs. This component has been developed with an emphasis on three areas: focusing assessments to specific learning objectives, whether they be national, state, district, or local; automating prescriptions to include all resources that the school or district has at its

disposal; and integrating administrative, staff, faculty, and student databases (including performance records) with existing databases.

The *A+nyWhere Learning System*® courseware will prescribe activities that may include any content or resources available to the educator. These activities can include computer-based content, Internet material, and non-computer material such as textbook lessons, group work, field trip, projects, etc. Capability to grade and identify mastery of these activities is also provided.

### **Hypothesis**

Eighth-grade student performance on the *A+LS Reading Assessment 8 (Form B)* is predicted to significantly correlate with his or her performance on the reading portion of the Oklahoma Performance Index (OPI). Additionally, the OPI scores for the sub-groups of English Language Learners (ELL) and Special Education (SE) students are each predicted to significantly correlate with the *A+LS Reading Assessment 8 (Form B)*.

## **METHODOLOGY**

### **Participants: Sample Characteristics**

The entire sample of 218 eighth-grade children was drawn from an Oklahoma middle school, Western Oaks Middle School, in 2006. Western Oaks Middle School serves 6-8th grade students and is located in Oklahoma City, Oklahoma. Of these students, 102 were female (46.8%) and 116 were male (53.2%). The ethnic background

of these students was mostly Caucasian (127 or 58.3%) with minority students composing the rest of the sample: African American (39 or 17.9%), Hispanic (26 or 11.9%), Native American (14 or 6.4%), Asian American (5 or 2.3%) or Other (7 or 3.2%). A slight majority of students (113 or 51.8%) were eligible for free and/or reduced lunch. Of the sample, 30 (13.8%) were English Language Learners and 45 (20.6%) were enrolled in Special Education.

### **Procedure**

For this observational study, all 218 eighth-graders took the *A+LS* assessment and the OPI in Fall 2006. For purposes of this report, the OPI scaled scores were used. These OPI scores were correlated with student performance on *A+LS* Reading Assessment 8 (Form B) for the sample of students after removal of the ELL or SE students, for ELL students only, and for SE students only. In addition, a regression line was calculated and included with each of the scatter plots to better illustrate the relationship between the OPI scaled score and the *A+LS* reading assessment.

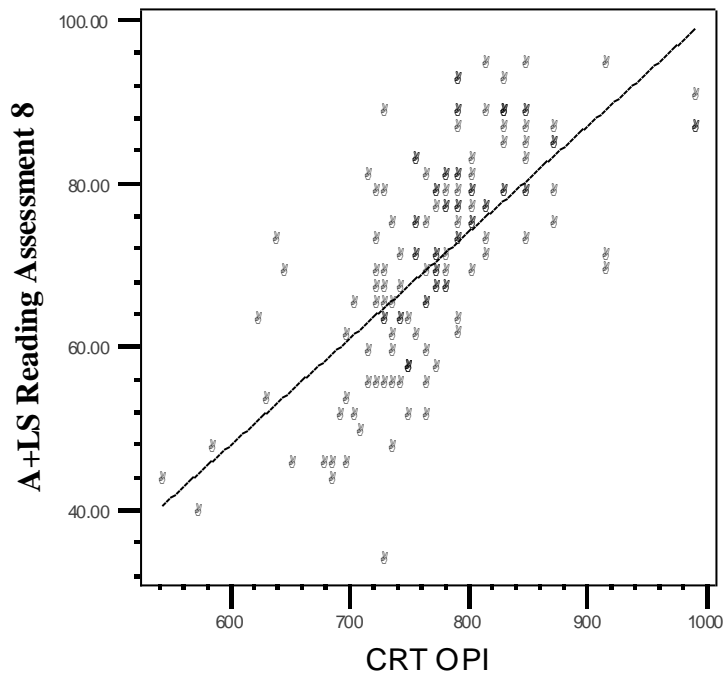
## **RESULTS**

Results are reported first by utilizing all the main student sample (after removal of ELL and SE students) and then by two specific groupings of students who are English Language Learners or students who are enrolled in Special Education.

### **Main Student Sample**

Utilizing students who were not ELL or enrolled in SE, a Pearson correlation coefficient was calculated for the *A+LS* Reading Assessment 8 (Form B) with the

Oklahoma Performance Index for reading. The correlation coefficient was highly significant:  $r(143) = 0.688, p < .001$ . Please see Figure 1 for a scatter plot with regression line. This result means that about 47% of the variance in the OPI scores was explained and predicted by the students' *A+LS* assessment average.

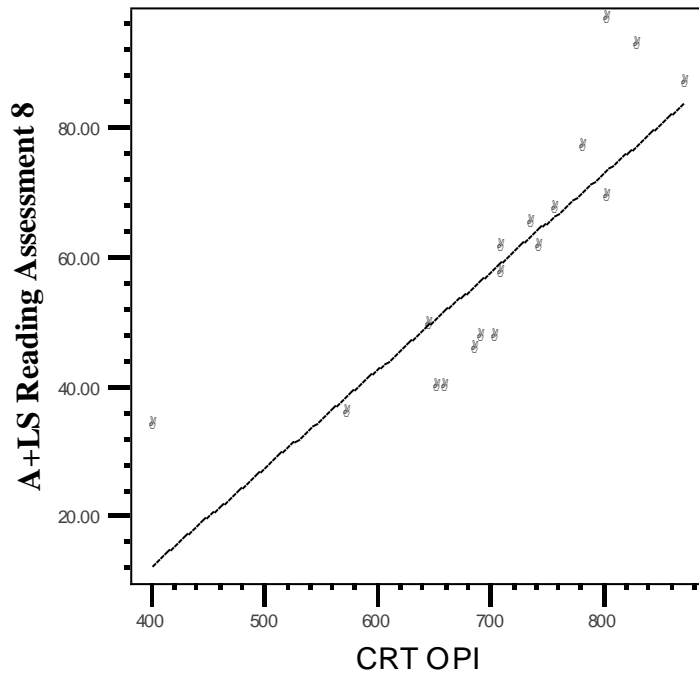


*Figure 1.* Scatterplot of Oklahoma Performance Index for Reading and the *A+LS* Reading Comprehension Assessment 8 (Form B) scores for 8<sup>th</sup> graders.

### **English Language Learners**

Utilizing only students classified as ELL, a Pearson correlation coefficient was calculated for the *A+LS* Reading Assessment 8 (Form B) with the Oklahoma Performance Index for reading. The correlation coefficient was highly significant:  $r(18) = 0.838, p < .001$ . Please see Figure 2 for a scatter plot with regression line.

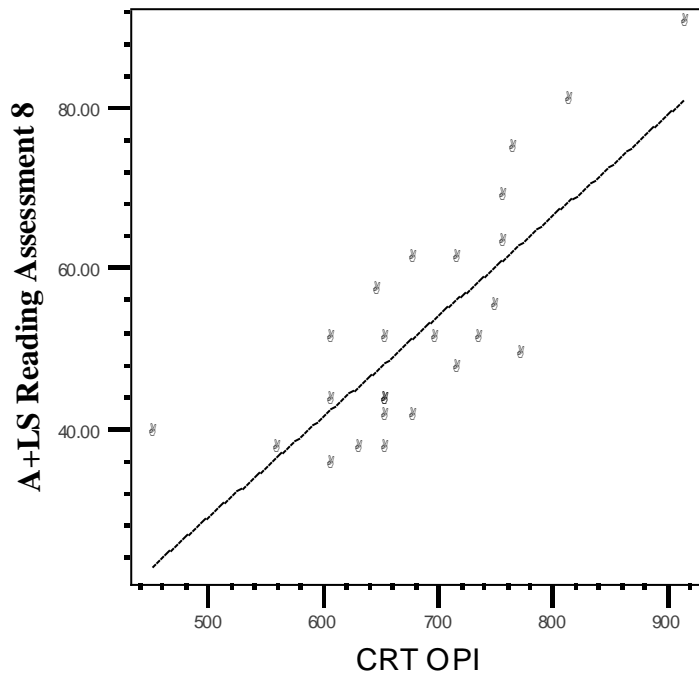
This result means that about 70% of the variance in the OPI scores was explained and predicted by the students' *A+LS* assessment average.



*Figure 2.* Scatterplot of Oklahoma Performance Index for Reading and the *A+LS* Reading Comprehension Assessment 8 (Form B) scores for ELL 8<sup>th</sup> graders.

### Special Education

Utilizing all the students enrolled in Special Education classes, a Pearson correlation coefficient was calculated for the *A+LS* Reading Assessment 8 (Form B) with the Oklahoma Performance Index for reading. The correlation coefficient was highly significant:  $r(25) = 0.790, p < .001$ . Please see Figure 3 for a scatter plot with regression line. This result means that about 64% of the variance in the OPI scores was explained and predicted by the students' *A+LS* assessment average.



*Figure 3.* Scatterplot of Oklahoma Performance Index for Reading and the *A+LS* Reading Comprehension Assessment 8 (Form B) scores for 8<sup>th</sup> graders enrolled in special education classes.

## DISCUSSION

The results indicate that the *A+LS* assessment tests have value for educators beyond their prescriptive function. *A+LS* assessments allow educators to identify students who are poor performers in advance of their state-mandated assessments and more importantly, with enough time to direct limited resources to helping those students in need. The usefulness of this predictive power is further enhanced by the reporting of the significant correlation between the *A+LS* assessment to the OPI. Specifically, this ability to predict a large percentage of a student's performance on the Oklahoma

standardized assessment enables educators to efficiently allocate scarce resources such as available tutors, additional time with computer-assisted learning, peer-to-peer interactions, or other educational interventions. This should translate into more efficient instruction of students prior to state-mandated assessments and increase the chances that schools make adequate yearly progress.

The results that were found for the students who were not ELL or enrolled in SE classes were of a smaller magnitude than earlier research (Vana Baker, Thompson & McDonald, 2007) with seventh-grade reading (about 47% variance explained as opposed to 61%). However, because this sample was predominantly Caucasian, it is interesting to note that the current results are very close to the earlier seventh-grade Caucasian-only sample (47% vs. 46%). These comparable results, while admittedly across different middle school grades, do suggest that the criterion validity of the *A+LS* reading assessments continues across school grades. More research is needed to clarify this possible result.

The strong correlations that were found with the ELL and Special Education students demonstrates that this *A+LS* is also useful for these important and growing student populations. However, due to a low number of students, caution is urged in applying these results as additional data is needed to support these ELL and SE research results.

Two obvious limitations of this observational validation study are the use of only one version of the eighth grade reading assessment and the use of the scaled scores from the Oklahoma Performance Index. Additional assessments and data are needed to enhance the robustness of these results. These outcomes will need to be combined with additional data relating student performance on multiple *A+LS* assessments to OPI assessments (and other assessments) to allow the development of tables based on regression equations that will serve as a useful guide for educators responsible for effectively distributing limited educational resources. Thus, future data gathering will need to accumulate enough data for each specific state's mandated assessments for students of differing grades, ethnic groups, socioeconomic status, gender, and other demographic variables. This will not be a task with a discrete endpoint but rather an ongoing one as states continue to refine their own educational assessments. However, as increasing amounts of data become available on the correlations between those state assessments and older established performance assessments, increasingly precise conclusions can be made about how each of the *A+LS* assessments predicts the performance of specific student demographic clusters. But this challenge does not change the fact that computer-based assessments are another tool in the educators' toolbox, and the results from this observation support the efficacy of this specific tool, an *A+LS* Reading Assessment 8 (Form B), as predicting student's performance on the Oklahoma Performance Index.