

**The Efficacy of Computer Assisted Tier 2 Assessment and Intervention as Part of
A Response-to-Intervention Model**

(CFDA 84.327A – Phase II)

ABSTRACT

Work over the past decade has demonstrated the validity and utility of Response-to-Intervention (RTI) as a process to assist in determining the presence of a learning disability (LD) in reading. While RTI holds great promise, its potential can not be realized unless implemented with fidelity by well prepared teachers using effective tools in environments that have the necessary infrastructure to support it. In this proposal, we seek to implement effective technological solutions to ensure that the most powerful RTI methods and procedures can be brought to bear in a consistent manner to overcome complex barriers to implementation fidelity; thus, increasing the probability of preventing reading difficulties among students at-risk for reading failure and more effectively identifying those students who require special education services in order to thrive. We believe that a technology-assisted RTI model can help in this endeavor. We propose to compare a technology-assisted RTI model to a Teacher-Directed RTI model. Our technology-assisted RTI model will utilize a comprehensive web-delivered instructional program, *i-station Reading*, which consists of five integrated components: (a) a computerized CPM system that utilizes a computer-adaptive testing algorithm (CAT) to monitor student growth on critical areas of reading across time, and place students into appropriate content within the curriculum, (b) Computer Based Instruction comprised of the critical content targeted to student's individual reading needs, (c) Web-based Teacher Reports that give teachers easy access to data collected by the network and analyzed by the backend data management system, and (d) Teacher Resources including downloadable lesson plans for use by the teacher

during teacher-led small groups. We will compare this technology-assisted RTI model to a more traditional teacher-directed RTI model.

We propose to work with 40 teachers and 240 first-graders in an urban high poverty school district divided into 2 cohorts (20 teachers and 120 students each of 2 years). Teachers will be randomized within school to one of two conditions: Technology-Assisted RTI or Teacher-Directed RTI. From each teacher's classroom, we will select at random 6 students meeting criteria as at-risk students within each classroom. We anticipate 10 or more children in each classroom meeting our criteria for risk. Risk status will be established through use of a rigorous screening procedure. We will assess both cohorts on an comprehensive battery of early reading assessments, which will include both pre-posttest assessment and continuous progress monitoring assessments. Likewise, we carefully document implementation fidelity and the nature of instruction delivered in the Teacher –Directed RTI condition. Further, we continue to collect assessment on each cohort of children for 1 or 2 years beyond intervention (depending on cohort). By studying students longitudinally, we can address a number of critical issues relevant to RTI that have not been previously examined.

We will use a hierarchical linear modeling (HLM) approach to examine academic gains. A three-level growth curve model will be examined with measurement occasions at level-1, students at level-2, and classrooms (or teachers) at level-3. The type of model that we are proposing is a variation on typical growth models. Given the potential instability in the measurement of growth and reading outcomes of the students in this proposed study, we will combine change point estimation theory with nonparametric regression and mixed-effects modeling in order to produce a model which both smoothes erratic data and allows for the dynamic change point estimation of multiple individuals simultaneously.