Review of K-12 Literacy and Math Progress Monitoring Tools

April 2013

In the following report, Hanover Research examines progress monitoring tools. The report begins with an assessment of the current discussion regarding the importance and effectiveness of different methods of progress monitoring, and concludes by profiling eight monitoring tool providers and a sample of their products.

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INTRODUCTION AND KEY FINDINGS

Monitoring student progress throughout the course of a semester or academic year has many potential benefits, as teachers are able to track student achievement and adjust instruction to meet student needs and accelerate learning. To help schools and districts implement these kinds of programs, this report investigates available methods of student progress monitoring. We begin in Section I by reviewing the literature on effective techniques and common models for progress monitoring. In Section II, we profile eight progress monitoring providers, many of which have been reviewed by nationally recognized organizations. Below we report key findings from this review.

KEY FINDINGS

- **National ratings boards have valued aimsweb, STAR, and Yearly Progress Pro products very highly in recent years.** Scholastic, mCLASS, and Istation products have received mixed reviews across the various criteria used.

- **Curriculum-based measurement (CBM) and computer-adaptive assessment (CAT) are the stand-out models of progress monitoring for today's educators, and are the common foundational models for progress monitoring products.** The focus of these models is frequent but brief standardized assessments, often customized to a student's ability level through tiered instruction or response-dependent item flow. Critics focus on the validity, reliability, and predictive value of both instructional materials (interventions) and assessment forms. Tools and systems that cannot provide for long-term tracking of achievement are considered outdated.

- **Districts often prioritize time obligations for assessment in order to increase time available for instructional activities.** Pearson **aims**web products require the least amount of time for assessment of those products reviewed, at only 1-8 minutes per assessment. Istation products require 30 minutes, but combine instruction and assessment via interactive "game-like" computer-based activities. Renaissance Learning products (STAR assessments) and McGraw-Hill Education's Yearly Progress Pro fell between these extremes at about 10-15 minutes per assessment.

- **Per-student pricing on progress monitoring products varies between $3.60 and $55.00.** However, some companies do not charge by the student, offering per-teacher or flat-rate subscription fees.

SECTION I: PROGRESS MONITORING

Progress monitoring is an educational practice by which student learning is regularly assessed and compared to established benchmarks or standards. The goal of progress monitoring is not punitive, but rather is to ensure that students are learning what the objectives of a curriculum have suggested will be taught.[1]

Continuous monitoring of student progress and targeting identified areas of weakness are essential components of overall academic improvement. For example, Algozzine, Wang, and Boukhtiarov (2011) "found that scores obtained from regular use of [STAR Reading and Scholastic Reading Inventory-Interactive] were statistically significant related to overall end-of-grade achievement markers."[2] Another study, focusing on special education programs, similarly concluded that regular progress monitoring not only improved student academic performance, but also made students more aware of and interested in their own academic goals and achievement.[3] That is, **progress monitoring is shown to accurately benchmark student achievement during the learning process and to engage students in their individual learning processes**.

This section then examines the importance of progress monitoring in improving student learning, as well as the most effective methods and components of progress monitoring.

EFFECTIVE PROGRESS MONITORING

According to the National Center on Response to Intervention (NCRTI), effective progress monitoring must (1) assess student performance, (2) quantify student rates of improvement and responsiveness to instruction, and (3) evaluate instruction methods for effectiveness.[4] The authors of one study argue that there are **four essential elements of progress monitoring**:

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[1] See, for example, [1] Deno, S.L. "Curriculum-based Measures: Development and perspectives." N.d. http://www.progressmonitoring.org/CBM_Article_Deno.pdf
[2] Wright, P.W.D., and Wright, P.D. "Progress monitoring." Wrightslaw.com. December 6, 2011. http://www.wrightslaw.com/info/progress.index.htm
[3] Safer, N., Bootel, J., and Holland Coviello, R. "Improving Student Outcomes through Progress Monitoring." Presentation for the Virginia Department of Education, September 28, 2006. http://www.studentprogress.org/doc/VASEA9-28-06.pdf
[4] "Common questions for progress monitoring." National Center on Student Progress Monitoring. http://www.studentprogress.org/progresmon.asp#2

[2] Algozzine, B., Wang, C., and Boukhtiarov, A. "A Comparison of Progress Monitoring Scores and End-of-Grade Achievement." *New Waves-Educational Research & Development.* 14:1, 2011, p.4. http://www.caerda.org/sitedev/pub/nw/14.pdf#page=5

[3] Fuchs, L.S., Denos, S., and Mirkin, P. "The Effects of Frequent Curriculum-Based Measurement and Evaluation on Pedagogy, Student Achievement, and Student Awareness of Learning." *American Educational Research Journal.* 21:2, Summer, 1984, pp.449-460.

[4] [1] "Progress Monitoring." National Center on Response to Intervention. http://www.rti4success.org/categorycontents/progress_monitoring
[2] Fuchs, L.S. and Fuchs, D. "What is scientifically-based research on progress monitoring?" Vanderbilt University. 2002, pp.1-6. http://www.osepideasthatwork.org/toolkit/pdf/ScientificallyBasedResearch.pdf

- **Representative content**: The content used for keeping track of progress must be representative of the academic performance expected of students at the end of the school year.

- **Sensitivity to change**: The measures must also be free of floor or ceiling effects and sensitivity to change over a short period of time, over repeated measurements as students gain more skills.

- **Authenticity**: The assessment must be authentic and have adequate technical characteristics (i.e., validity and reliability).

- **Predictive results**: The outcomes must accurately predict improvements on more generalized assessment measures, such as standardized tests.[5]

That is, progress monitoring targets the core curriculum through repeatable assessments that align with other standardized assessments. Practitioners have developed a variety of practical tools to meet these demands, and debated which or if there is a "best" model of progress monitoring.[6] The NCRTI does not specify a single best method, but it does recommend that schools implementing a new progress monitoring procedure:

- Ensure that the monitoring tools are appropriate for the age and skill level of the students being assessed;

- Determine a pre-set schedule for administration of the test;

- Develop an outline and agenda for regular review meetings;

- Establish rules that govern how many data points will be collected and how much time must elapse before progress is evaluated; and

- Monitor the fidelity of the data-based decision-making practices, including assessment and instruction.[7]

Four general progress monitoring models are discussed below: curriculum-based measurement (CBM), computer-adaptive assessment, mastery measurement, and classroom assessment. Section II examines specific tools in more detail.

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[5] Algozzine, Wang, and Boukhtiarov. "A Comparison." Op. cit., p.4.

[6] [1] Quenemoen, R., Thurlow, M., Moen, R., Thompson, S., and Morse, A.B. "Progress Monitoring in an Inclusive Standards-based Assessment and Accountability System." National Center on Educational Outcomes. February, 2004. http://www.cehd.umn.edu/nceo/OnlinePubs/Synthesis53.html
[2] Fuchs and Fuchs. "What is scientifically-based research." Op. cit., pp.1-6.

[7] National Center on Response to Intervention. "Progress Monitoring Brief #1: Common Progress Monitoring Omissions: Planning and Practice." National Center on Response to Intervention. January, 2013, pp.1-4. http://www.rti4success.org/pdf/RTI%20ProgressMonitoringBrief1-Planning%20and%20Practice.pdf

GENERAL PROGRESS MONITORING MODELS

CURRICULUM-BASED MEASUREMENT

Curriculum-based measurement (CBM) is one of the most studied and popular methods of progress monitoring. CBM uses frequent, regular administration of short tests that measure identical skills over an extended period of time. CBM testing follows the establishment of clear, preset academic goals for comparison with student progress.[8] CBM tests may include exercises in which students read a passage aloud in front of a teacher for one minute. The teachers who administer this test will evaluate student performance immediately and record the test results. After multiple versions of the test have been administered, teachers can plot the results in graph format to provide an illustration of student progress. By comparing student performance to the preset academic goals, teachers can readjust goals to match a student's trajectory or determine specific areas for improvement that can be addressed in adapted instructional plans.[9]

> *Curriculum-Based Measurement:*
> - *Five-minute tests (oral or written)*
> - *Weekly to monthly administration*
> - *Identical skills tested over time*

CBM supports three essential educational functions: skill evaluation, progress monitoring, and instructional improvement. As a skill evaluation tool, CBM identifies students who struggle and students who excel so that they can receive targeted instruction. As a progress monitoring tool, CBM measures gradual progress over short or long periods of time, allowing teachers to identify areas in need of additional instruction. As an instructional improvement tool, CBM indicates whether specific teaching methods are effective at improving student performance.[10]

CBM graphs present information in an understandable way that can be used in parent conferences and multidisciplinary team meetings within the school district. Student-specific performance measurements can prevent the unnecessary assignment of struggling students to special education programs by identifying students that only need some additional support in order to succeed in general education classes. CBM measurements targeted toward English language learner students also may provide a more accurate assessment of student ability that prevents them from being incorrectly classified as learning disabled.[11]

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[8] "What Is Curriculum-Based Measurement And What Does It Mean to My Child?" National Center on Student Progress Monitoring. http://www.studentprogress.org/families.asp

[9] Ibid.

[10] Fuchs and Fuchs. "What is scientifically-based research." Op. cit., pp.1-6.

[11] Deno, S.L., "Developments in curriculum-based measurement." *Journal of Special Education*. 37:3, 2003, pp.184-192. http://www.quop.de/uploads/media/Deno.pdf

COMPUTER-ADAPTIVE ASSESSMENT

Computer-adaptive assessment (CAT) programs measure student performance by adjusting the test's question sequence depending on whether a student answers the previous question correctly or incorrectly. If a student misses a question, the next question delivered by the system is easier; if the student answers correctly, a more difficult question is produced. This method provides a precise measurement of

Computer-Adaptive Assessment:
- *Can be self-administered*
- *Questions adjusted* in situ *based on responses*
- *Identical skills tested over time*

student ability in an expedient manner, requiring minimal effort on the part of the test administrator.[12] CAT programs are seen to save school districts the trouble of developing enough alternate tests to ensure the reliability of frequent test administrations. These products may include additional tools that automatically graph or sort student data.[13]

Some research has attempted to demonstrate differences between CAT and CBM, but has fallen short of conclusive demonstrations of difference or effectiveness.[14] Others, however, have demonstrated that faithful implementation of "technology-enhanced continuous progress-monitoring" (i.e., CAT) to "manage and differentiate instruction" does increase student gains in mathematics education.[15] More research is needed to test this progress monitoring model and/or to compare it to others.[16]

MASTERY MEASUREMENT

"Mastery measurement" (MM) assesses student performance by administering tests of increasing difficulty to students over a determined period of time. After proficiency in one skill is proven, following tests measure different skills.[17] This model evaluates skill proficiency at a single point in time, but cannot assess student academic growth over an

Mastery Measurement:
- *Resource-intensive*
- *Skills tested follow logical, rather than adaptive, progression*
- *Cannot provide longitudinal data*
- *Validity and reliability challenges*

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[12] Mathes, P. "Computer Adaptive Testing System for Continuous Progress Monitoring of Reading Growth for Students Grade 4 to Grade 8." Istation. 2011, pp.8-11.
http://www.istation.com/Content/downloads/studies/ar_technical_report.pdf

[13] Safer, N., and Fleischman, S. "Research Matters/How Student Progress Monitoring Improves Instruction." *Educational Leadership*. 62:5, February, 2005, pp.81-83.
http://www.scred.k12.mn.us/UserFiles/Servers/Server_3022443/File/rtl%20center/breakout%20sessions/Edleadershiparticle ProgMon.pdf

[14] Shapiro, E.S., and Gebhardt, S.N. "Comparing Computer-Adaptive and Curriculum-Based Measurement Methods of Assessment." *School Psychology Review*. 41:3, September 2012, pp. 295-305. Accessed via ProQuest Education.

[15] Ysseldyke, J., and Bolt, D.M. "Effect of Technology-Enhanced Continuous Progress Monitoring on Math Achievement." *School Psychology Review*. 36:3, September 2007, pp. 453-467. Accessed via ProQuest Education.

[16] We note that both Shapiro and Gebhardt (2012) and Ysseldyke and Bolt (2007) specifically used STAR Mathematics as the CAT program in their experiments.

[17] Fuchs and Fuchs. "What is scientifically-based research." Op. cit., pp.1-6.

extended period.[18] MM also follows a logical (rather than empirical) hierarchy of skills, in which skill progression is predetermined and not responsive to student testing results. These results can be misleading, anyway, because they are linked to narrow, single-skill assessments designed by teachers and textbook companies; the reliability and validity of assessment is not guaranteed. Lacking reference to larger, generalized skills sets, MM assessments may not be designed to relate to high-stakes tests.[19]

Because of limitations on longitudinal achievement tracking and adaptive or responsive skills measurement, the once-popular MM is now seen as outdated. The model is also resource-intensive, requiring schools or districts to develop, administer, and grade tests that cover a wide range of skills.[20]

CLASSROOM ASSESSMENTS

Classroom methods of evaluating student progress are often custom assessments written by teachers or textbook providers. The practice of using such methods is currently in a "dismal state," according to R.J. Stiggins.[21] Classroom evaluation methods require teachers to have a clear understanding of the class's academic goals and the ability to generate questions that reliably test student proficiency. Administering and developing such tests is time consuming. This assessment method, however, allows teachers to develop more customized, complex assessments of student proficiency than methods such as CBM or computer-adaptive assessments that rely on quick, regular testing methods.[22]

Classroom Assessments:
- *Resource-intensive*
- *Highly customizable and allows for complex assessment of proficiency*
- *Validity and reliability challenges*

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[18] Safer and Fleischman. "Research Matters." Op. cit., pp.81-83.

[19] Fuchs, L. and Oxaal, I. "Progress Monitoring: What, Why, How, When, Where." National Student Progress Monitoring Center. http://www.rti4success.org/pdf/progressmonitoringwhatwhyhowwhenwhere.pdf

[20] Shinn, M. "Measuring General Outcomes: A Critical Component in Scientific and Practical Progress Monitoring Practices." Aimsweb. January, 2013, p.7. http://www.aimsweb.com/wp-content/uploads/Mark-Shinn-GOM_Master-Monitoring-White-Paper.pdf

[21] See, e.g., Stiggins, R.J. "The Unfulfilled Promise of Classroom Assessment." *Educational Measurement: Issues and Practice*. 20:3, September 2001, pp. 5-15.

[22] Quenemoen, Thurlow, Moen, Thompson, and Morse. "Progress Monitoring." Op. cit.

SECTION II: PROGRESS MONITORING TOOLS

METHODOLOGY

This section profiles monitoring tools offered by eight companies, including Pearson **aims**web, the Scholastic Inventories, and Fountas & Pinnell. These tools were selected based on positive rankings by two organizations that regularly review and rate progress monitoring tools: the government-funded National Center on Intensive Intervention (NCII)[23] and the NCRTI.[24] Both organizations are closely associated with the American Institutes for Research, the Technical Assistance and Dissemination Network, and the U.S. Office of Special Education Programs housed in the U.S. Department of Education.

The NCRTI's Technical Review Committee (TRC), staffed by seven progress monitoring experts, determines the ranking of progress monitoring tools on its chart.[25] A similar 10-member TRC, sharing some members with the NCRTI TRC, rates academic progress monitoring tools for the NCII.[26] The linkages between the two TRCs again demonstrates the close association of these two organizations.

NCRTI conducted its fourth annual review of progress monitoring tools in 2012.[27] It uses an invitation process in which vendors of such tools can submit an application for their product(s) to be reviewed against a set of criteria established by NCRTI's Technical Review Committee in three stages of critique with two opportunities to seek more complete information from the vendors about their products. Tools placed on the NCRTI chart remain there "for the duration of the Center's funding period," and vendors "can re-submit with new evidence in subsequent years if they would like to improve their ratings."[28] The published chart rates tools according to 10 criteria:

- Reliability of the performance level score
- Reliability of the slope
- Validity of the performance level score
- Predictive validity of the slope of improvement

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[23] "About Us." National Center on Intensive Intervention. http://www.intensiveintervention.org/about-us

[24] "About the National Center on Response to Intervention (NCRTI)." National Center on Response to Intervention. http://www.rti4success.org/aboutus

[25] "Technical Review Committee Membership." National Center on Response to Intervention. http://www.rti4success.org/trcMembers

[26] Note that NCII regularly reviews four categories of tools during its funding period: Academic Intensive Intervention, Academic Progress Monitoring, Behavioral Intensive Intervention, and Behavioral Progress Monitoring. "Center's Technical Review Committees." National Center on Intensive Intervention. http://www.intensiveintervention.org/about-us/centers-technical-review-committees

[27] "Progress Monitoring Tools." National Center on Response to Intervention. http://www.rti4success.org/progressMonitoringTools

[28] "Technical Review Committees Process." National Center on Response to Intervention. http://www.rti4success.org/reviewProcess

- Alternate forms

- Sensitive to student improvement

- End-of-year benchmarks

- Rates of improvement specified

- Norms disaggregated for diverse populations

- Disaggregated reliability and validity data

Tools currently on the chart include products to monitor reading, math, and related skills produced by the following 14 brands: **aims**web, CBM, DIBELS, easyCBM, Edcheckup, Istation, mCLASS, Monitoring Basic Skills Progress, Orchard Software, Scholastic, STAR, STEEP, Vanderbilt, and Yearly ProgressPro.[29]

The NCII uses a similar submission-based process to select products for its review.[30] Vendors are called upon to submit an application for their product(s) to be reviewed against a set of established criteria in three stages of critique with two opportunities to seek more complete information from the vendors about their products. Tools placed on the NCII chart remain there "for the duration of the Center's funding period," and vendors "may re-submit with new evidence in subsequent years if they would like to improve their ratings."[31] The NCII rankings assess 13 total criteria, nine of which are identical to NCRTI criteria:

- Reliability of the performance level score

- Reliability of the slope

- Validity of the performance level score

- Predictive validity of the slope of improvement

- Disaggregated reliability and validity data

- Alternate forms

- Sensitive to student improvement

- End-of-year benchmarks

- Rates of improvement specified

- Decision rules for changing instruction*

- Decision rules for increasing goals*

- Improved student achievement*

- Improved teacher planning*

* Not rated by the NCRTI

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[29] "Progress Monitoring Tools." National Center on Response to Intervention. Op. cit.

[30] "Call for Submissions Materials." National Center on Intensive Intervention.
http://www.intensiveintervention.org/content/call-submissions-materials

[31] "Technical Review Committees Process." National Center on Intensive Intervention.
http://www.intensiveintervention.org/content/technical-review-committees-process

The NCII chart lists products that monitor reading, math, and related skills from the following 13 brands: **aims**web, CBM, DIBELS, easyCBM, Edcheckup, FAST, Istation, mCLASS, Monitoring Basic Skills Progress, Scholastic, STAR, STEEP, and Yearly ProgressPro.[32] Note that NCII manages two separate lists of progress monitoring tools; our focus rests on the General Outcomes Measures (GOM) list, rather than the Mastery Measures (MM) list.

Figure 2.1 lists the eight companies considered in this section and provides additional details on specific products, assessment philosophy, administration time, and cost. Note that the NCRTI and NCII lists (the foundation for our profile selection) are not inclusive of all progress monitoring tools available. The appendix of this report contains a list of additional progress monitoring tools that were not included in the NCRTI and NCII lists.

Figure 2.1: Summary of Progress Monitoring Tools

COMPANY	PROGRESS MONITORING TOOL	ASSESSMENT PHILOSOPHY	ADMINISTRATION TIME	COST PER STUDENT
Pearson	**aims**web Complete	CBM	1-8 minutes	$6
	aimsweb Reading	CBM	1-8 minutes	$4
	aimsweb Math	CBM	1-8 minutes	$4
	aimsweb Language	CBM	1-8 minutes	$5
Scholastic	Reading Inventory	Computer-adaptive	30 minutes	$10-$30
	Math Inventory	Computer-adaptive	*	$10-$15
	Phonics Inventory	Non-progress management	< 10 minutes	$30-$35
Fountas and Pinnell	Online Data Management System	Fountas and Pinnell Guided Reading	*	$30 (per teacher)
Renaissance Learning	STAR Reading	Computer-adaptive	15-20 minutes	$3.60
	STAR Math	Computer-adaptive	15-20 minutes	$3.60
	STAR Early Literacy	Computer-adaptive	15-20 minutes	$3.60
iSTEEP	STEEP	CBM	*	$4-$7
Istation	Istation	Computer-adaptive	30 minutes	$55
Wireless Generation	mCLASS: DIBELS Next	DIBELS	*	*
	mCLASS: IDEL	DIBELS	*	*
	mCLASS: Reading 3D	DIBELS	*	*
	mCLASS: TPRI	One-on-one assessment	*	*
	mCLASS: Tejas LEE	One-on-one assessment	*	*
	mCLASS: Math	Frequent testing supplemented by interviews	*	*
McGraw Hill Education	Yearly ProgressPro	CBM	15 minutes	$9.25

* Information unavailable
Source: Product websites, interviews with company representatives

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[32] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. http://www.intensiveintervention.org/chart/progress-monitoring

PEARSON AIMSWEB

As described on the product's "About" pages, "**aims**web is a product of Pearson, the global leader in education and education technology."[33]

FOUNDATIONS

The **aims**web collection serves as "a universal screening, progress monitoring, and data management system that supports Response to Intervention (RTI) and tiered instruction."[34] Reading, math, spelling, and writing are addressed for students in kindergarten through grade 8, with some measures adapted to grades 9-12.[35] Assessment tools are built on the CBM model, specifically the "general outcome measurement" form. The **aims**web assessments are "brief, predictive, sensitive to improvement, easy to administer and score, valid, standardized and reliable, and available in multiple equivalent forms."[36]

TOOLS AND ASSESSMENTS

As shown in Figure 2.2, on the following page, **aims**web offers products in Reading, Language Arts, Mathematics, and Behavior, with subdivisions for early literacy (English and Spanish), reading (English and Spanish), reading maze, spelling, written expression, early numeracy, math concepts and applications, and math computation. The **aims**web system "provides up to 33 alternate forms per skill, per grade."[37] Each **aims**web assessment takes between one and eight minutes to administer.[38] The **aims**web products are compatible with tablets and mobile devices.[39]

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[33] "Pearson." aimsweb. http://www.aimsweb.com/about/pearson

[34] See "What is aimsweb?" at "aimsweb FAQs." aimsweb. http://www.aimsweb.com/about/faqs

[35] aimsweb. "aimsweb: The most comprehensive assessment system for grades K-12." Pearson Education. 2012, pp.1-6. http://www.aimsweb.com/wp-content/uploads/Pearson_aimsweb_web_spread.pdf

[36] "Curriculum-Based Measurement." aimsweb. http://www.aimsweb.com/about/curriculum-based-measurement

[37] "Assessments." aimsweb. http://www.aimsweb.com/products/features/assessments

[38] "Response to Intervention." Pearson Education. http://www.education.pearsonassessments.com/pai/ea/productlisting.htm?Community=EA_PreK-12_AI_RTI

[39] aimsweb. "aimsweb: The most comprehensive." Op. cit., p.5.

Figure 2.2: Pearson aimsweb Assessment Areas

Reading
- Early Literacy: K-1 grade[40]
  - Letter Naming Fluency
  - Letter Sound Fluency
  - Phoneme Segmentation Fluency
  - Nonsense Word Fluency
- Spanish Early Literacy: K-1 grade[41]
  - Letter Naming Fluency
  - Letter Sound Fluency
  - Syllable Segmentation Fluency
  - Syllable Reading Fluency
  - Syllable and Word Spelling
  - Oral Reading Fluency
- Reading (English and Spanish): K-8 grade[42]
  - Oral Reading
- Reading Maze: 1-8 grade[43]
  - Reading Comprehension

Language Arts
- Spelling[44]
  - Standard Spelling
- Written Expression[45]
  - Standard Writing

Behavior

Mathematics
- Early Numeracy: K-1 grade[46]
  - Oral Counting
  - Missing Number
  - Number Identification
  - Quantity Discrimination
- Math Concepts and Applications: 2-8 grade[47]
  - Number Sense
  - Measurement
  - Operations
  - Patterns and Relationships
  - Data
- Math Computation: 1-8 grade[48]
  - Size of Numbers
  - Column Addition
  - Basic Facts
  - Complex Computation
  - Decimals
  - Fractions
  - Conversions
  - Percentages
  - Integers
  - Expressions
  - Reductions
  - Equations
  - Exponents

CRITICAL RECEPTION

Scholastic Administr@tor magazine awarded **aims**web a "Best in Tech" award twice,[49] and the program received high ratings on both the NCRTI[50] and the NCII[51] progress measurement tool ranking lists. The NCII ratings are reproduced in Figure 2.3 below. As

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[40] "Test of Early Literacy." aimsweb. http://www.aimsweb.com/products/features/assessments/test-of-early-literacy
[41] "MIDE." aimsweb. http://www.aimsweb.com/products/features/assessments/mide
[42] "Reading CBM." aimsweb. http://www.aimsweb.com/products/features/assessments/reading-cbm
[43] "Maze." aimsweb. http://www.aimsweb.com/products/features/assessments/maze
[44] "Spelling CBM." aimsweb. http://www.aimsweb.com/products/features/assessments/spelling-cbm
[45] "Written Expression." aimsweb. http://www.aimsweb.com/products/features/assessments/written-expression
[46] "Test of Early Numeracy." http://www.aimsweb.com/products/features/assessments/test-of-early-numeracy
[47] "Math Concepts and Applications." aimsweb. http://www.aimsweb.com/products/features/assessments/match-concepts-applications
[48] "Math Computation." aimsweb. http://www.aimsweb.com/products/features/assessments/math-computation
[49] "Pearson's Aimsweb Honored as Best in Tech for Reading and Math Intervention by Scholastic Administr@tor." PRWeb. March 10, 2009. http://www.prweb.com/releases/2009/03/prweb2218324.htm
  "Scholastic Administrator Best in Tech Awards 2010." *Scholastic Administr@tor*. September/October, 2009. http://www.scholastic.com/browse/article.jsp?id=3754504
[50] "Progress Monitoring Tools." National Center on Response to Intervention. Op. cit.
[51] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. Op. cit.

demonstrated, **aims**web did not receive strong ratings from the NCRTI and NCII for score validity in its math computation program, predictive validity in its math concepts and applications program, and sensitivity to student improvement for its early numeracy programs.

Figure 2.3: Pearson aimsweb Inventories, NCII Progress Monitoring Ratings

SUBJECT AREA	MATH COMPUTATION	MATH CONCEPTS AND APPLICATIONS	ORAL READING	EARLY LITERACY	EARLY NUMERACY
Reliability of the Performance Level Score	●	●	●	●	●
Reliability of the Slope	●	●	●	●	●
Validity of the Performance Level Score	○	●	●	●	●
Predictive Validity of the Slope of Improvement	–	○	●	●	●
Disaggregated Reliability and Validity Data	–	–	●	●	●
Alternate Forms	◉	◉	●	●	●
Sensitive to Student Improvement	●	●	●	●	○
End-of-Year Benchmarks	●	●	●	●	●
Rates of Improvement Specified	●	●	●	●	●
Decision Rules for Changing Instruction	●	●	●	●	●
Decision Rules for Increasing Goals	●	●	●	●	●
Improved Student Achievement	–	–	–	–	–
Improved Teacher Planning	–	–	–	–	–

● = Convincing evidence of effectiveness　　◉ = Partially-convincing evidence of effectiveness
○ = Unconvincing evidence of effectiveness　– = Data unavailable
Source: NCII

One experimental study found that **aims**web may be a more effective and reliable predictor of student reading achievement than the Dynamic Indicators of Basic Early Literacy Skills (DIBELS). However, the authors also caution that there remains a significant area for improving and validating the reliability of reading assessment tools.[52]

COST

Customers can purchase aimsweb assessment services as a complete package, or they can purchase individual **aims**web products.[53] The complete **aims**web package costs $6 per

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[52] Ardoin, S. and Christ, T. " Curriculum-Based Measurement of Oral Reading: Standard Errors Associated With Progress Monitoring Outcomes from DIBELS, Aimsweb, and an Experimental Passage Set." *School Psychology Review*. 38:2, 2009, pp.266-183. http://www.cehd.umn.edu/edpsych/faip-r/documents/standarderrorsprogressmonitoring.pdf

[53] "aimsweb Complete." aimsweb. http://www.aimsweb.com/products/subscriptions/complete

student, per year. The standalone language arts product costs $5 per student, per year. The **aims**web math and reading products each cost $4 per student, per year. The **aims**web behavior program costs $4 per student, per year, with an unspecified upgrade available for $1 extra per student, per year. Training for the **aims**web programs can be arranged for additional fees ranging from $2,500 per session (1-day on-site, up to 30 people) to $6,600 per session (3-day on-site, up to 30 people). Remote consultations cost $250 per hour.[54]

SCHOLASTIC INVENTORIES

Scholastic was founded in 1920, and for nearly a century has worked "to encourage the intellectual and personal growth of all children, beginning with literacy, the cornerstone of all learning." The Scholastic enterprise includes book publishing and distribution, media, educational technology, classroom magazines, and progress monitoring assessments.[55]

FOUNDATIONS

Scholastic offers three different assessment products: Scholastic Math Inventory (SMI), Scholastic Reading Inventory (SRI), and Scholastic Phonics Inventory (SPI). SMI and SRI are both computer-adaptive assessment programs.[56] SMI is aimed at students in grades 2 through 9, targeting the eventual goal of fluency in Algebra I.[57] SRI measures reading comprehension for students in kindergarten through grade 12.[58] SPI is computer-administered, but not computer-adaptive. Its primary function is to identify and classify struggling students rather than to measure academic growth over an extended period of time. Whereas SRI works at all three tiers of Response to Intervention (RTI), SPI targets only Tier II and Tier III students for small group and individual interventions beyond the core curriculum.[59]

TOOLS AND ASSESSMENTS

SMI measures student performance in over 460 specific skills divided into five "strands," including algebra, geometry, measurement, numbers and operations, and probability and statistics.[60] SRI tests students' reading abilities by administering a series of passage-based

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[54] "2013-2014 School Year." aimsweb. http://www.aimsweb.com/wp-content/uploads/aimsweb_SY13-14.pdf

[55] "About Scholastic." Scholastic. http://www.scholastic.com/aboutscholastic/index.htm

[56] [1] "Scholastic Math Inventory: Program Overview." Scholastic. http://teacher.scholastic.com/math-assessment/scholastic-math-inventory/program-overview.html
[2] "Reading Assessment Program Overview." Scholastic. http://teacher.scholastic.com/products/sri_reading_assessment/programoverview.htm

[57] "Scholastic Math Inventory: Program Overview." Scholastic. Op. cit.

[58] "Reading Assessment Program Overview." Scholastic. Op. cit.

[59] [1] Wagner, R.K. "Scholastic Phonics Inventory Technical Guide." Scholastic. 2011, pp.4-7. http://teacher.scholastic.com/products/readingassessment_spi/pdfs/SPI_TechManual_OnLine.pdf
[2] "Response to Intervention Framework: Reading Assessment: Scholastic Phonics Inventory." Scholastic. http://teacher.scholastic.com/products/readingassessment_spi/rti_framework.html

[60] "QTaxon Search Results." Scholastic. http://www.scholastic.com/mathdatabase/q_taxons?advanced_search=0&keywords=&state=&state_goal=&grade=&strand=&q_measure_min=&q_measure_max=&x=28&y=15

reading tests.[61] SRI also automatically generates a recommended personal reading list based on student test performance.[62] SPI uses 10-minute tests to target students who have difficulty decoding words and understanding phonics.[63]

SMI and SRI both received positive ratings from the NCII and NCRTI, while SPI was not ranked by either organization. SMI and SRI received "convincing evidence" ratings for the reliability and validity of their scoring methods, the number of alternate forms, sensitivity to student improvement, end-of-year benchmarking, and specification of rates of improvement. These ratings are depicted in Figure 2.4 on the following page. However, the panels who ranked SMI and SRI did not find data for a number of rating categories, including the reliability and validity of the slope (which indicates if the slope of improvement accurately reflects the students' rate of improvement),[64] the existence of disaggregated data for specific student sub-groups, support of decisions rules, and evidence of improved student achievement and improved teacher planning.[65]

Figure 2.4: Scholastic Inventories, NCII Progress Monitoring Ratings

SUBJECT AREA	SCHOLASTIC MATH INVENTORY	SCHOLASTIC READING INVENTORY
Reliability of the Performance Level Score	●	●
Reliability of the Slope	–	–
Validity of the Performance Level Score	●	●
Predictive Validity of the Slope of Improvement	–	–
Disaggregated Reliability and Validity Data	–	–
Alternate Forms	●	●
Sensitive to Student Improvement	●	●
End-of-Year Benchmarks	●	●
Rates of Improvement Specified	●	●
Decision Rules for Changing Instruction	–	–
Decision Rules for Increasing Goals	–	–
Improved Student Achievement	–	–
Improved Teacher Planning	–	–

● = Convincing evidence of effectiveness ◑ = Partially-convincing evidence of effectiveness
○ = Unconvincing evidence of effectiveness – = Data unavailable
Source: NCII

[61] "Reading Assessment Program Overview." Scholastic. Op. cit.
[62] "Reading Assessment Program Overview: Student Experience." Scholastic.
    http://teacher.scholastic.com/products/sri_reading_assessment/Student_Experience.htm
[63] Wagner, R.K. "Scholastic Phonics Inventory." Op. cit., pp.4-7.
[64] "Academic Progress Monitoring GOM Headers." National Center on Intensive Intervention.
    http://www.rti4success.org/progressMonitoringTools
[65] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. Op.cit.

COST

Scholastic Inventory products are all sold separately, rather than as a bundle.[66] However, once purchased, all Scholastic Inventory products can be integrated into the Scholastic Achievement Manager (SAM), which manages all Scholastic technology products from a single interface.[67] SAM is organized hierarchically, providing detailed data at the district, teacher, and student levels.[68]

SRI is sold in packages of 50, 200, or 2,500 licenses, where one license supports assessment services for one student. The Scholastic Inventory package of 50 licenses is $1,500 (averaging to $30 per student), the 200-license package costs $2,950 (averaging to $14.75 per student), and the 2,500-license package costs $25,000 (averaging to $10 per student). Schools may pay an additional four dollars per student to host the program remotely rather than on school servers.[69] Campus-based software prices are a one-time fee, while Scholastic-hosted programming is charged as an annual subscription.[70] Scholastic provides additional Reading Inventory training and support services for fees ranging from $250 per site to $2,899 per site.[71]

SPI is sold in packages of 60 licenses for $2,100, averaging to $35 per student. Additional licenses can be added in sets of 25 for $750, which average to $30 per student. The SMI program at the 200 license level costs $2,950 (averaging to $14.75 per student). Customers can be purchase additional licenses in packages of 50 for $499 (averaging to $9.98 per student). Product support plans for the SPI and SMI cost $250.[72]

FOUNTAS AND PINNELL

Billed as "the preeminent voices in literacy education," the namesakes of this company have a strong grounding in educational publishing, professional development, and teaching. The Fountas and Pinnell products emerged from work in intervention leading to a line of engaging texts for struggling readers and a continuum outlining achievement and skill, as well as related products to support the teachers using these materials.[73]

FOUNDATIONS

The Fountas and Pinnell (F&P) system provides a variety of reading support services, including assessment, intervention, instruction, and progress monitoring tools. The F&P

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[66] "Products Powered by SAM." Scholastic. http://teacher.scholastic.com/products/sam/products.htm
[67] "Scholastic Phonics Inventory Order Form" Scholastic. May, 2009, p.1.
   http://teacher.scholastic.com/products/readingassessment_spi/pdfs/SPI_OrderForm_HBG.pdf
[68] "Benefits for District Administrators." Scholastic.
   http://teacher.scholastic.com/products/sam/benefits/administrators.htm
[69] "Scholastic Reading Inventory Order Form." Scholastic. August 2012, p.2.
   http://teacher.scholastic.com/products/sri_reading_assessment/pdfs/5986_SRI_Sell_Sheet_HBI.pdf
[70] Manning, Lyndsey. Central Region Sales Agent, Scholastic. E-mail correspondence. March 21, 2013.
[71] "Scholastic Reading Inventory Order Form." Scholastic. Op. cit., p.2.
[72] "Assessment Product Order Form." Scholastic. March, 2012.
[73] See, e.g., "The Fountas & Pinnell Story." Fountas & Pinnell. 2011.
   http://www.heinemann.com/fountasandpinnell/FountasPinnellStory.pdf

program covers students from kindergarten through grade 8.[74] The F&P method assesses student reading levels using a series of benchmarking texts. F&P does not strictly follow CBM, but monitors progress by testing students multiple times per year according to a continuum of 27 levels that determine a student's skill level at a given point in time.[75]

TOOLS AND ASSESSMENTS

The F&P assessment system measures student understanding of assigned reading texts to determine each student's needed level of instruction. Students can be grouped according to proficiency level to facilitate targeted instruction.[76] The F&P Online Data Management System (ODMS) is a software package that allows teachers to customize and manage student assessment results. After manually inputting their results, teachers can analyze student performance – arranged in graphs and charts – to understand student growth and areas for improvement. The F&P software allows teachers to maintain student records over multiple years in order to observe student progress over extended periods of time.[77]

CRITICAL RECEPTION

The F&P progress monitoring tool is not included in the NCII or NCRTI rating lists. The ODMS largely functions to support the F&P group reading technique and measures student performance according to that predefined standard. The system is not designed around national norms or percentiles and is not intended to measure national student achievement.[78] Because of this, many of the criteria evaluated by the NCII and NCRTI may not be applicable to the F&P system.

COST

The F&P progress monitoring tool is a web-based platform that costs $30 per teacher for one year of services.

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[74] "Fountas & Pinnell Reading Assessment Resources." Heinemann.
    http://www.heinemann.com/fountasandpinnell/reading-assessment.aspx
[75] "FAQs: Benchmark Assessment System (BAS)." Heinemann.
    http://www.heinemann.com/fountasandpinnell/faqs_bas.aspx
[76] "About Leveled Texts." Fountas and Pinnell.
    http://www.fountasandpinnellleveledbooks.com/aboutLeveledTexts.aspx
[77] "Online Data Management System for *Fountas Pinnell Benchmark Assessment System* and *Sistema de evaluacion de la lectura.*" Heinemann. February, 2012, pp.1-16.
    http://www.heinemann.com/shared/supportingMaterials/benchmark/BenchmarkQuickGuide.pdf
[78] "Research & Data Collection: Benchmark Assessment System." Heinemann.
    http://www.heinemann.com/fountasandpinnell/researchBAS.aspx

RENAISSANCE LEARNING STAR ASSESSMENTS

STAR Assessments are produced by Renaissance Learning, which describes itself as "a technology-based educational company with a primary focus on accelerating K-12 learning."[79] The founders, who sold the company to Permira in 2011, were responsible for successful programs like Accelerated Reader, Accelerated Math, STAR Assessments (discussed below), and Renaissance Professional Development.[80]

FOUNDATIONS

The STAR Assessment programs support "instructional decisions, RTI, and instructional improvement" by measuring student progress in early literacy, reading, and math. The early literacy program measures student proficiency from the pre-kindergarten to grade 3 level.[81] The reading and math programs assess student skill for grades 1 to 12.[82] STAR tests are computer-adaptive.[83]

TOOLS AND ASSESSMENTS

STAR Reading measures student progress in 36 different skills that are divided into five distinct domains. These domains include Word Knowledge and Skills, Analyzing Literary Text, Comprehension Strategies and Constructing Meaning, Understanding Author's Craft, and Analyzing Argument and Evaluating Text.[84] According to the STAR website, each STAR reading assessment takes 15 minutes,[85] although an independent study of the STAR reading test concluded that the average amount of time taken on each assessment is closer to seven minutes.[86]

STAR Math measures student proficiency in 54 sets of skills grouped into four domains: Numbers and Operations, Algebra, Geometry and Measurement, and Data Analysis, Statistics, and Probability.[87] The company suggests that STAR Math assessments take 15 to 20 minutes to complete.[88]

STAR Early Literacy tests the emerging literacy and numeracy skills of young students in 41 skill sets arranged in three domains: Word Knowledge and Skills, Comprehension Strategies and Constructing Meaning, and Numbers and Operations.[89] The STAR Early Literacy test can be completed in about 10 minutes.[90]

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[79] "About Us." Renaissance Learning. 2013. http://www.renlearn.com/aboutus/
[80] "Milestones." Renaissance Learning. 2013. http://www.renlearn.com/aboutus/milestones.aspx
[81] "STAR Early Learning Enterprise: Introduction." Renaissance Learning. http://www.renlearn.com/sel/default.aspx
[82] "STAR Reading Enterprise: Introduction." Renaissance Learning. http://www.renlearn.com/sr/default.aspx
[83] "How STAR Reading Enterprise Works." Renaissance Learning. http://www.renlearn.com/sr/howitworks.aspx
[84] "Star Reading Enterprise: Skills Tested." Renaissance Learning. http://www.renlearn.com/sr/skills.aspx
[85] "How STAR Reading Enterprise Works." Renaissance Learning. Op. cit.
[86] Algozzine, Wang, and Boukhtiarov. "A Comparison." Op. cit., p.4.
[87] "Star Math Enterprise: Skills Tested." Renaissance Learning. http://www.renlearn.com/sm/skills.aspx
[88] "How STAR Math Enterprise works." Renaissance Learning. http://www.renlearn.com/sm/howitworks.aspx
[89] "Star Early Literacy Enterprise: Skills Tested." Renaissance Learning. http://www.renlearn.com/sel/skills.aspx
[90] "How STAR Early Literacy Enterprise works." Renaissance Learning. http://www.renlearn.com/sel/howitworks.aspx

CRITICAL RECEPTION

The STAR Assessments each received "convincing evidence" ratings in 10 of the NCII's progress monitoring categories, as depicted in Figure 2.5. However, evidence of the effectiveness of the math and reading programs at improving student performance was only partially convincing to NCII's panel, and any evidence of the early literacy program's effectiveness was unconvincing. The early literacy program also received poor marks on the subject of decision rules. NCII did not report any data for the STAR programs on improving teacher effectiveness.[91]

Figure 2.5: STAR Assessments, NCII Progress Monitoring Ratings

SUBJECT AREA	STAR MATH	STAR READING	STAR EARLY LITERACY
Reliability of the Performance Level Score	●	●	●
Reliability of the Slope	●	●	●
Validity of the Performance Level Score	●	●	●
Predictive Validity of the Slope of Improvement	●	●	●
Disaggregated Reliability and Validity Data	●	●	●
Alternate Forms	●	●	●
Sensitive to Student Improvement	●	●	●
End-of-Year Benchmarks	●	●	●
Rates of Improvement Specified	●	●	●
Decision Rules for Changing Instruction	●	●	●
Decision Rules for Increasing Goals	●	●	○
Improved Student Achievement	◒	◒	○
Improved Teacher Planning	–	–	–

● = Convincing evidence of effectiveness   ◒ = Partially-convincing evidence of effectiveness
○ = Unconvincing evidence of effectiveness   – = Data unavailable
Source: NCII

According to a 2011 study in *New Waves-Educational Research & Development*, the STAR Reading test is an effective predictor of middle-school student performance on the standardized Florida Comprehensive Assessment Test (FCAT). The study concludes that the Scholastic Reading Inventory-Interactive (SRI-I) test is similarly effective at predicting student performance on the statewide test. The authors of the study, however, observe that the per-student administration time for the STAR Reading test averaged to around seven minutes. In contrast, Scholastic advertises an average administration time of 20 to 30 minutes for its SRI-I tests – three or more times as long as the STAR assessment. A common sentiment of school teachers and administrators, according to the report, is that regular

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[91] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. Op. cit.

progress monitoring – while valuable – is too time consuming. The 15 or more minutes of time made available by using the STAR test may mitigate some of the negative consequences of frequent testing.[92]

A 2007 study in the *School Psychology Review* concluded that students who were regularly monitored using the STAR math test performed significantly better on national standardized tests of academic achievement than students who were not subject to a continuous progress monitoring system.[93]

COST

Subscriptions to each STAR product cost $3.60 per student, and the smallest subscription size available is 100 students. In addition to the per-student subscription fee, subscribers must pay $499 annually for online product hosting services. New subscribers to STAR must pay a $1,599 one-time licensing fee.[94]

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[92] Algozzine, Wang, and Boukhtiarov, "A Comparison." Op.cit., pp.16-17.
[93] Yseeldyke and Bolt, "Effect of Technology-Enhanced," Op. cit.
[94] John. Sales Representative, Renaissance Learning. Phone interview. March 22, 2013.

ISTEEP

iSteep describes itself as "an innovation leader" providing "powerful tools to assist school [*sic*] in implementing programs designed to determine if students are on track and to accelerate their performance if they are below desired levels."[95]

FOUNDATIONS

The System to Enhance Educational Performance (STEEP) is a comprehensive assessment system that tests students' performance in math and reading from kindergarten to grade 12. STEEP uses the CBM method of evaluation. While tests can be administered through a computer format, they are not computer-adaptive.[96]

TOOLS AND ASSESSMENTS

STEEP can be licensed in two formats: Site License or Computer Assessment. The Site License offers 14 different assessments and six progress monitoring "probes" administered via paper and pencil. The Site License is accompanied by web-based data management tools that support progress monitoring and data presentation. The Computer Assessment plan is paper-free and provides a wider range of data measurement and reporting tools. The STEEP program automatically administers tests to students, so teachers do not need to be involved with test administration.[97]

The STEEP model tests student math and reading performance from kindergarten to grade 12 and incorporates a separate reading diagnostic tool for grades 1 through 9. The iProgress program accompanies the STEEP Computer Assessment plan, providing additional progress monitoring support with over 50 alternative forms for each subject area.[98] The STEEP software adheres to the Schools Interoperability Framework (SIF),[99] a set of data standards that allows K-12 data to be shared between institutions and organizations. STEEP can be integrated with tablets and mobile devices for convenient testing and data management.[100]

CRITICAL RECEPTION

STEEP received high ratings in eight different NCII categories; the NCII did not collect data on the remaining five rating categories. The NCII ratings for STEEP are presented in Figure 2.6 on the following page.[101]

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[95] "About iSTEEP." STEEP. http://www.isteep.com/about_us.html
[96] Ibid.
[97] "Product Options." STEEP. http://www.isteep.com/dataoptions.html#prod
[98] Ibid.
[99] "Why Interoperability?" SIF Association. https://www.sifassociation.org/AboutUs/Why-Interoperability/Pages/default.aspx
[100] "About iSTEEP." STEEP. Op. cit.
[101] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. Op. cit.

Figure 2.6: STEEP, NCII Progress Monitoring Ratings

SUBJECT AREA	STEEP ORAL READING FLUENCY
Reliability of the Performance Level Score	●
Reliability of the Slope	●
Validity of the Performance Level Score	●
Predictive Validity of the Slope of Improvement	●
Disaggregated Reliability and Validity Data	-
Alternate Forms	●
Sensitive to Student Improvement	●
End-of-Year Benchmarks	●
Rates of Improvement Specified	●
Decision Rules for Changing Instruction	-
Decision Rules for Increasing Goals	-
Improved Student Achievement	-
Improved Teacher Planning	-

● = Convincing evidence of effectiveness   ◉ = Partially-convincing evidence of effectiveness
○ = Unconvincing evidence of effectiveness   − = Data unavailable
Source: NCII

COST

The Site License system costs $4.28 per student, and the Computer Assessment model costs $7.49 per student. Support and implementation services for the STEEP software cost $400 for elementary- and secondary-specific packages or $500 for a combination package that covers all school levels.[102]

MCGRAW HILL EDUCATION YEARLY PROGRESSPRO

McGraw Hill Education was historically a sector of The McGraw-Hill Companies, founded in 1888 when the McGraw and Hill publishing companies merged interests. The Companies have been "a leader in providing high quality information and analysis across global markets for more than a century."[103] In 1965 a key merger brought California Test Bureau (CTB) to McGraw-Hill, "strengthening the Company's leadership in the elementary and high school education and assessment market."[104] CTB is still sometimes listed as a joint partner in McGraw-Hill Education marketing materials.

In 2013, however, this sector was sold to Apollo Global so the Companies could distinguish itself "as a powerhouse in credit ratings, benchmarks and analytics for the global capital and commodity markets."[105] McGraw-Hill Companies sources seem to remain the accurate

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[102] "Product Options," STEEP, Op. cit.
[103] "Corporate History." McGraw-Hill. 2013. http://www.mcgraw-hill.com/site/about-us/corporate-history
[104] "About Us." McGraw-Hill Education. 2013. http://www.mheducation.com/about/about-us
[105] "Corporate History," McGraw-Hill, Op. cit.

sources for this program, for now, as the McGraw-Hill Education "About Us" page does not yet reference the transfer of ownership.[106]

FOUNDATIONS

Yearly ProgressPro (YPP) is sold as one of several "Interim & Formative Assessment" packages in the CTB/McGraw-Hill Education collection.[107] YPP provides web-based reading and math assessments for grades 1 through 8. YPP follows the CBM method of progress monitoring, and specifically aligns with Response to Intervention (RTI).[108]

TOOLS AND ASSESSMENTS

YPP includes instructional resources that introduce each skill to be tested, as well as both CBM and classroom assessment tools to generate appropriate testing instruments. Associated reporting focuses on performance and progress related to the given skill, or by indicators differentiated by student, class, district, and demographic levels. YPP tests can be completed in about 15 minutes and are organized so that they can be administered on a weekly basis. YPP Reading and Math share an interface,[109] although each product can be purchased separately.[110]

CRITICAL RECEPTION

YPP received high rankings in eight of the NCII ranking categories, as depicted in Figure 2.7 on the following page. Evidence of disaggregated data was not used in YPP's rating. The NCII rating panel found only unconvincing evidence of YPP's effectiveness in guiding decision rules and improving student and teacher performance.[111]

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[106] "About Us," McGraw-Hill Education, Op. cit.
[107] "Interim & Formative Assessment." CTB/McGraw-Hill Education.
   http://www.ctb.com/ctb.com/control/productCategoryViewAction?productCategoryId=327&p=products
[108] "Yearly ProgressPro Overview." McGraw-Hill.
   http://www.ctb.com/ctb.com/control/productFamilyViewAction?productFamilyId=591&p=products#
[109] Ibid.
[110] "Yearly ProgressPro: Reading Language Arts." National Center on Response to Intervention.
   http://www.rti4success.org/tools_charts/popups_progress/programPopup.php?url=yppLA&title=Yearly%20Progr
   essPro&area=Reading%20Language%20Arts
[111] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. Op. cit.

Figure 2.7: Yearly ProgressPro, NCII Progress Monitoring Ratings

SUBJECT AREA	YEARLY PROGRESSPRO MATH	YEARLY PROGRESSPRO READING LANGUAGE ARTS	YEARLY PROGRESSPRO READING MAZE FLUENCY
Reliability of the Performance Level Score	●	●	●
Reliability of the Slope	●	●	●
Validity of the Performance Level Score	●	●	●
Predictive Validity of the Slope of Improvement	●	●	●
Disaggregated Reliability and Validity Data	-	-	-
Alternate Forms	●	●	●
Sensitive to Student Improvement	●	●	●
End-of-Year Benchmarks	●	●	●
Rates of Improvement Specified	●	●	●
Decision Rules for Changing Instruction	○	○	○
Decision Rules for Increasing Goals	○	○	○
Improved Student Achievement	○	○	○
Improved Teacher Planning	○	○	○

● = Convincing evidence of effectiveness   ◉ = Partially-convincing evidence of effectiveness
○ = Unconvincing evidence of effectiveness   − = Data unavailable
Source: NCII

COST

YPP costs $9.25 per student. New orders for fewer than 350 students are accompanied by a one-time $1,700 technology fee.[112]

ISTATION

Istation was founded in 1998 by Richard H. Collins, an entrepreneur and investor "driven by the desire to fuel innovation in the classroom and elevate the academic results in U.S. schools."[113]

FOUNDATIONS

The Istation progress monitoring system assesses student skill and progress in early or advanced reading, with Spanish and mathematics tools available or in development.[114]

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[112] "Yearly ProgressPro: Reading Language Arts." Op. cit.
[113] "Read More" tab for Richard H. Collins at "Management Team." Istation. 2013.
   http://www.istation.com/About/ManagementTeam
[114] [1] "Assessments." Istation. http://www.istation.com/Assessment
   [2] "ISIP Early Reading." Istation. http://www.istation.com/Assessment/ISIPEarlyReading#/
   [3] "ISIP Advanced Reading." Istation. http://www.istation.com/Assessment/ISIPAdvancedReading
   [4] "ISIP Espanol." Istation. http://www.istation.com/Assessment/ISIPEspanol
   [5] "ISIP Math." Istation. http://www.istation.com/Assessment/ISIPMath

Istation is a CAT program that shares some characteristics with the MM method of assessment. When students exhibit mastery of one skill, Istation begins testing new skills.[115]

TOOLS AND ASSESSMENTS

Istation relies on animated, game-like interactions to test student performance. Early reading skills are measured in phonemic awareness, alphabetic knowledge, vocabulary, comprehension, and fluency.[116] The advanced reading program assesses student proficiency in word analysis, fluency, vocabulary, and comprehension.[117]

Istation arranges test results in a variety of different reports, including reports that identify struggling students, summarize class performance, illustrate growth, and classify students according to the three-tiered Response to Intervention system.[118] Istation also provides curriculum recommendations based on student results.[119]

This program does not require constant Internet connection to function, nor does it require storage space on school servers. Rather, assessment items are downloaded from the Internet and cached onto school computers. If a student completes the full number of relevant questions on his or her machine, Istation will retrieve new questions from another machine on campus. This process also supports Istation if Internet connection is lost.[120] Assessments require about 30 minutes for administration; the program is set up to administer new tests automatically on a monthly basis.[121] Teachers are not required to follow this schedule, though, and may give tests more frequently if they wish.[122] The Istation system is compatible with tablets and mobile devices.[123]

CRITICAL RECEPTION

Istation received high ratings in six of the NCII's progress monitoring categories, including data reliability, alternate forms, benchmarking, and specification of rates of improvement. These ratings are depicted in Figure 2.8 on the following page. However, the NCII panel felt that Istation showed unconvincing evidence of sensitivity to student performance. There were insufficient data to evaluate Istation's performance in the remaining six categories.[124]

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[115] "Individualized Instruction." Istation. http://www.istation.com/Reports/IndividualizedInstruction
[116] "ISIP Early Reading." Istation. Op. cit.
[117] "ISIP Advanced Reading." Istation. Op. cit.
[118] "Data-driven results." Istation. http://www.istation.com/Reports/DataDrivenResults
[119] "Assessments." Istation. Op. cit.
[120] Barrett, Kelsey. Sales Representative, Istation. Phone interview. March 21, 2013.
[121] "Individualized Instruction." Istation. Op. cit.
[122] Barrett, Kelsey. Sales Representative, Istation. Phone interview. March 21, 2013.
[123] "Data-driven results." Istation. Op. cit.
[124] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. Op. cit.

Figure 2.8: Istation, NCII Progress Monitoring Ratings

SUBJECT AREA	EARLY READING	ADVANCED READING
Reliability of the Performance Level Score	●	●
Reliability of the Slope	●	●
Validity of the Performance Level Score	●	●
Predictive Validity of the Slope of Improvement	-	-
Disaggregated Reliability and Validity Data	-	-
Alternate Forms	●	●
Sensitive to Student Improvement	○	○
End-of-Year Benchmarks	●	●
Rates of Improvement Specified	●	●
Decision Rules for Changing Instruction	-	-
Decision Rules for Increasing Goals	-	-
Improved Student Achievement	-	-
Improved Teacher Planning	-	-

● = Convincing evidence of effectiveness   ◉ = Partially-convincing evidence of effectiveness
○ = Unconvincing evidence of effectiveness   – = Data unavailable
Source: NCII

The Istation Indicators of Progress (ISIP) are strongly correlated to the language arts portion of state standardized tests in Florida, according to a 2011 study. The authors of the study, which was commissioned by the Hillsborough County school board, recommended that the district identify struggling students who would most benefit from Istation and ensure that those students regularly use the Istation system.[125]

A 2007 Southern Methodist University study found that the ISIP were somewhat more effective at predicting student performance in kindergarten through grade 3 on the reading portion (especially comprehension tests) of statewide Texas Assessment of Knowledge and Skills than the DIBELS system. The study, which was limited to the four youngest grades in four Dallas-area elementary schools, showed that the ISIP were relatively reliable across different alternate assessment forms and therefore provided a consistent representation of student progress.[126]

COST

Pricing for Istation varies based on region and arrangements with the area sales manager, but a typical price is about $55 per student. The complete campus package, an alternative to the per-student model, charges a flat fee for the service on one campus: about $6,500. Campuses with more than 118 students in the program will save money by choosing the

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[125] Gaughan, L. "Report of iStation 2009 Second Grade-2010 Third Grade Users." Hillsborough County Public Schools. October, 2011, pp.1-10.
http://www.sdhc.k12.fl.us/itsweb/AssessmentReports/IstationGrade2.3report10.2011.pdf
[126] Mathes, P. "ISIP Concurrent and Predictive Validity Study." Institute for Reading Research. April 16, 2007, pp.1-32.
http://www.istation.com/Content/downloads/studies/isipcv.pdf

complete campus package. Support and training services cost $500 per hour for a three-hour personal webinar in which an unlimited number of people can participate. Two to three hour on-site visits cost $2,500. Istation provides additional, free training in the form of prerecorded webinars that accompany the Istation assessment program.[127]

WIRELESS GENERATION MCLASS

Wireless Generation was founded by "two Rhodes Scholars who shared a passion for technology and what it could do for educators" in 2000. In addition to the mCLASS assessment products discussed below, the company offers products in Curriculum & Instruction, Professional Services, and Data Systems.[128] Wireless Generation was bought in 2010 by Rupert Murdoch's News Corp, then fastened to a new subsidiary called Amplify.[129]

FOUNDATIONS

mCLASS is a suite of 10 assessment tools which support progress monitoring according to distinct models of formative assessment and instructional intervention. For example, mCLASS DIBELS Next/IDEL and mCLASS Reading 3D use the DIBELS system of progress monitoring, which focuses on regular, short assessments to measure student progress in early literacy – much like the CBM method.[130] DIBELS and CBM measure somewhat different material, though, and CBM material extends beyond early literacy subjects.[131] The mCLASS TPRI (and "its Spanish counterpart, mCLASS Tejas LEE") uses the TPRI method of assessment, consisting of one-on-one early reading assessment.[132] The mCLASS Math uses a frequent-assessment method similar to CBM and DIBELS, but its structure of regular, short testing is supplemented by additional one-on-one diagnostic interviews between teachers and students.[133] The complete list of Assessment products is as follows:

- mCLASS Beacon
- mCLASS DIBELS Next
- mCLASS IDEL
- mCLASS Reading 3D

- mCLASS TPRI
- mCLASS Tejas LEE
- Burst Reading Early Literacy Intervention
- The Writers' Express

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[127] Barrett. Op. cit.

[128] "About Us." Wireless Generation. http://www.wirelessgeneration.com/company/about

[129] [1] Watters, A. "Enough for Schools to Trust It?" Hack Education blog. July 24, 2012.
http://www.hackeducation.com/2012/07/24/amplify-news-corp-phone-hacking/
[2] Pelto, J. "When it comes to K through 12 education, we see a $500 billion sector in the U.S.' – Rupert Murdoch." Wait, What? blog. January 31, 2013. http://jonathanpelto.com/tag/wireless-generation/

[130] "mCLASS: DIBELS Next – How It Works." Wireless Generation.
http://www.wirelessgeneration.com/assessment/mclass-dibels/how-it-works

[131] "Frequently Asked Questions about Curriculum-Based Measurement." National Center on Student Progress Monitoring. http://www.studentprogress.org/faq.asp#_Toc89594729

[132] "mCLASS: TPRI." Wireless Generation. http://www.wirelessgeneration.com/assessment/mclass-tpri-tejaslee/overview

[133] "mCLASS: Math – How It Works." Wireless Generation. Op. cit.
"mCLASS: Math – What You Get." Wireless Generation. http://www.wirelessgeneration.com/assessment/mclass-math/what-you-get

- mCLASS Math
- mCLASS CIRCLE[134]

Each tool is grounded in a somewhat different pedagogical foundation. We discuss some of these below in "Tools and Assessments."

TOOLS AND ASSESSMENTS

The DIBELS-based tools measure early literacy and reading aptitude using one-minute fluency tests administered multiple times during the year.[135] Teachers administer the tests using a computer or mobile device, which then uploads data into the reporting software. The reporting software can then generate a series of reports and activity recommendations based on assessment data.[136] The creators of DIBELS state that DIBELS testing takes 10 minutes per child, and they recommend that it be administered three times per year.[137]

The mCLASS TPRI/Tejas Lee uses an almost identical platform to process test results from the computer-aided TPRI assessment, generating reports and recommendations automatically.[138] TPRI's one-on-one assessments are administered three times per year.[139] mCLASS Math uses different testing methods depending on the age of the student. In kindergarten and grade 1, students participate in one-on-one assessments with teachers. These assessments are one-minute measures. In grades 2 and 3, students sit for written two-minute assessments in groups.[140] The mCLASS Math is a computer-aided, but not computer-adaptive, system. After manually administering assessments, teachers must input the assessment results into the mCLASS system. Teachers follow assessments with diagnostic interviews, guided by the mCLASS program, to identify the best instructional method for each student. After assessment and interview data have been entered into the system, mCLASS provides detailed reports that teachers can use to measure progress, identify struggling students, and develop new instructional strategies.[141]

CRITICAL RECEPTION

The mCLASS Math was the only mCLASS product rated by the NCII and NCRTI. It received positive ratings in the reliability and validity of its scoring system and the support of end-of-year benchmarks. It scored poorly on its ability to reliable identify and predict trends in student performance. These ratings are demonstrated in Figure 2.9.[142]

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[134] "Help Me Choose." Wireless Generation. http://www.wirelessgeneration.com/help-me-choose/
[135] "What are DIBELS?" University of Oregon Center on Teaching and Learning.
 https://dibels.uoregon.edu/training/measures/dibelsinfo.php
[136] "mCLASS: DIBELS Next – How It Works." Wireless Generation. Op. cit.
[137] "What are DIBELS?" University of Oregon Center on Teaching and Learning. Op. cit.
[138] "mCLASS: TPRI." Wireless Generation. http://www.wirelessgeneration.com/assessment/mclass-tpri-tejaslee/overview
[139] "About TPRI." TPRI. Op. cit.
[140] "mCLASS: Math – How It Works." Wireless Generation. Op. cit.
 "mCLASS: Math – What You Get." Wireless Generation. Op. cit.
[141] "mCLASS: Math – How It Works." Wireless Generation. Op. cit.
[142] "Academic Progress Monitoring GOM." National Center on Intensive Intervention. Op. cit.

Figure 2.9: mCLASS Math, NCII Progress Monitoring Ratings

SUBJECT AREA	COMPUTATION	CONCEPTS	ORAL COUNTING	MISSING NUMBER	NEXT NUMBER	NUMBER FACTS	NUMBER IDENTIFICATION	QUANTITY DISCRIMINATION
Reliability of the Performance Level Score	●	●	●	●	●	●	●	●
Reliability of the Slope	○	○	○	○	○	○	○	○
Validity of the Performance Level Score	●	●	●	●	●	●	●	●
Predictive Validity of the Slope of Improvement	○	○	-	○	-	○	-	○
Disaggregated Reliability and Validity Data	-	-	-	-	-	-	-	-
Alternate Forms	-	●	-	◐	◐	●	●	●
Sensitive to Student Improvement	-	-	-	-	-	-	-	-
End-of-Year Benchmarks	●	●	●	●	●	●	●	●
Rates of Improvement Specified	-	-	-	-	-	-	-	-
Decision Rules for Changing Instruction	-	-	-	-	-	-	-	-
Decision Rules for Increasing Goals	-	-	-	-	-	-	-	-
Improved Student Achievement	-	-	-	-	-	-	-	-
Improved Teacher Planning	-	-	-	-	-	-	-	-

● = Convincing evidence of effectiveness   ◐ = Partially-convincing evidence of effectiveness
○ = Unconvincing evidence of effectiveness   – = Data unavailable
Source: NCII

COST

Wireless Generation does not provide pricing information for its mCLASS products to anyone other than school or district representatives who express interest in one of the products.[143]

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[143] Louisa. Sales Representative, Wireless Generation. Phone interview. March 22, 2013.

APPENDIX: OTHER PROGRESS MEASUREMENT TOOLS

This section contains a list of other progress measurement and assessment tools identified in the course of this research.[144] These programs were not included on the NCII or NCRTI lists of programs.

- A+ LearningLink, American Education Corporation[145]
- Path Driver for Reading and Math, School Specialty, Inc.[146]
- Carnegie Adaptive Math Software Solutions[147]
- Odyssey, CompassLearning[148]
- iReady Diagnostic and Instruction, Curriculum Associates[149]
- Northstar Math, Harcourt Achieve[150]
- Lexia Reading, Lexia Learning Systems[151]
- Read 180, Scholastic[152]
- Student Progress Monitoring System, Vantage Learning[153]

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[144] Bolch, M. "Assessment Data at Your Fingertips." *Tech & Learning.* 29:8, March, 2009. pp.34-37. Accessed via ProQuest Education.
[145] "A+ LearningLink." American Education Corporation. http://www.apluslearninglink.com/
[146] "Path Driver for Reading and Math." School Specialty, Inc. http://eps.schoolspecialty.com/other/pathdriver/
[147] "Adaptive Math Software." Carnegie Learning. http://www.carnegielearning.com/secondary-solutions/adaptive-math/
[148] "See Real Results with Odyssey." CompassLearning. http://www.compasslearning.com/odyssey
[149] "i-Ready Diagnostic and Instruction." Curriculum Associates. http://www.curriculumassociates.com/products/iready/diagnostic-instruction.aspx
[150] "Northstar Math." Harcourt Achieve. http://www.northstarmath.com/Home/Home.aspx
[151] "Assessment without Testing." Lexia Learning Systems. http://www.lexialearning.com/index.php/product/assessment-without-testing/
[152] "Read 180." Scholastic. http://read180.scholastic.com/reading-intervention-program
[153] "Student Progress Monitoring System." Vantage Learning. http://www.vantagelearning.com/products/spms/

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