

Appendix 9 Chicago-Strategic Teaching and Evaluation of Progress (STEP)

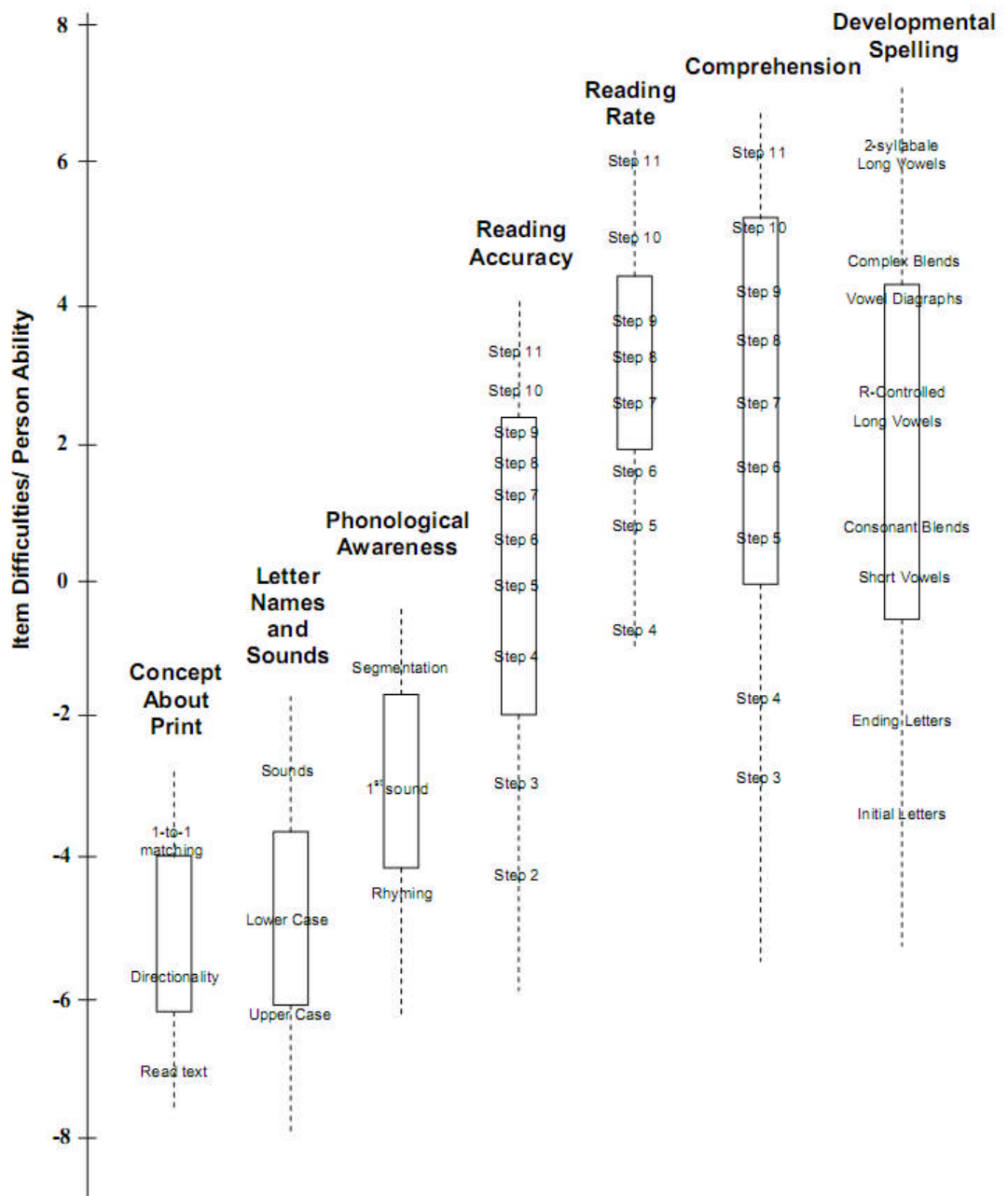
This case study develops a set of parallel scales of development to help monitor the learning progress in reading.

The Strategic Teaching and Evaluation of Progress (STEP) developmental assessment process for reading was developed at the Center for Urban School Improvement in Chicago over a ten-year period. The project worked with the Chicago Public Schools and others to study its impact and to test its performance by application of the Rasch model. STEP has much in common with other progress maps (DART, First Steps). The development process is documented by Kerbow & Bryk (2005) and is a key example in the annual 2008 *Brown Lecture in Education Research* of the American Educational Research Association by Raudenbush (2009).

The design of the system grew out of the Observation Survey from Reading Recovery (Clay, 1993) broadening a process applied in a tutoring context to the full classroom. The developers explored the psychometric properties of all the components of the survey and built up an appreciation of the difficulty relationships of each of the components. From this they were able to map out the relationship of the seven sub scales so that the scales, tasks within scales, and tasks across scales were aligned on a common logit scale. From this they were able to describe 12 steps from ages 5 to 8 (K-3 in their terms) that integrated the tasks from each of the subscales into a cohesive relationship of development. The process identified a general strategy for reading development over a 16 logit span from book orientation and letter recognition through to effective reading with fluency and comprehension at approximately 600 Lexiles and spelling words with double consonants 2-syllable vowel patterns by step 12.

The steps average about 1 logit apart but with the logit distance between steps decreasing (see Figure A9.1) as higher steps are achieved (consistent with other trajectories scaled in logits). The key factor determining improvement at the lower levels (steps 2 to 4) is explained as 'problem solving the words of the text'. Kerbow & Bryk believe students are 'learning enormous amounts about how letter patterns function and how to use this information to solve words' in these early steps. As students progress to higher text levels, the additional demand to reach decoding accuracy begins to decrease suggesting that the 'skill of problem-solving words and reading accurately becomes less of a hurdle as text levels increase.' (p. 51).

Figure A9.1 Overview of STEP subscales and step relationships (from Figure 3 Kerbow & Bryk, 2005)



While the step structure is used as the reference for ‘data points’ (that is as categories to indicate current reading status) the logit scale itself could be used as a complimentary progress scale for learning development, particularly as the logit scale better reflects an equality of increments than do the steps. As described above the spaces in logits between step achievement decreases with higher steps, making the ‘step scale’ increments unequal in ‘difficulty’.

A key to the utility of the ‘map’ and aligned assessment processes is the ‘visualisation’ developed from the assessment information, which allows the teacher to document the development of each student in a form readily appreciated by the teacher, other teachers and the school generally. STEP reports provide clear intuitive graphical representations of student

status and growth (in steps). While initially developed as paper charts for each student, recorded as a 'wall chart', the concepts of the visualisation have been incorporated into computer screen reports generated by software into which progress records are easily entered. The record shows the current step for the student as well as the number of steps progressed since the beginning of the school year, that is both current status and rate of change, taken in readily by the clear colour assisted screen layout. The tool provides simple intuitive cues to remind teachers where each student is but the data are held in a form that can also be subjected to summary and general arithmetic for year-to-year and other analyses.

The visualisation concepts are not unique to the STEP project. Software has been developed to record student progress to support other developmental record schemes (Kidmap in Australia for Levels, First Steps or other ordered structures; mClass from Wireless Generation for DIBELS and PALS, Progress Assessment Series from Pearson) all include graphic reports.

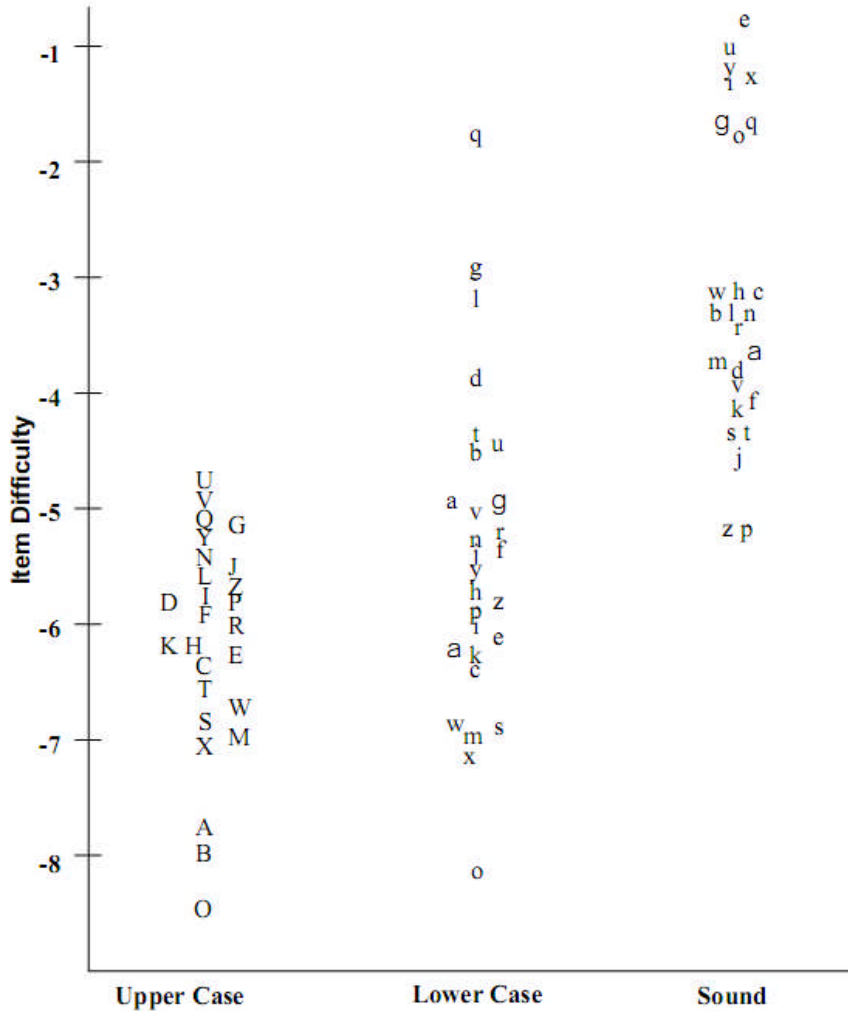
STEPs draws on the Lexile project to provide sets of levelled texts (difficulty determined using the Rasch calibrated Lexile analyser) that are the focus of individual conferences with the student (meeting the personalisation criteria of Fullan et al.). The teacher records reading accuracy and fluency, observes student reading behaviours, and engages students in comprehension conversations. Accompanying a given step are relevant assessment tasks that probe the skill profile on the other subscales to establish student status on these linked developments. The process has parallels with other probing conversation formats (NumPA from NZ as an example) and is acknowledged by the developers to be similar to other early literacy assessments but that 'the explicit combination of these tasks in developmental sequence is unique to the STEP Assessment and is organized on both a theoretical as well as an empirical basis.' (Kerbow & Bryk, 2005, p. 15.). Two parallel forms of the assessment at each step are provided (yellow and purple) to support repeat application of the assessment at a given step. The assumption is that two versions of the assessments will suffice since teachers do not use the assessment until their observations of the student confirm that the criteria for that step have been met. As a result the assessment is effectively confirming the teacher's observations. The second parallel version is used as a later follow-up assessment where a teacher over estimated the development of the student's reading.

Given the detail available in the developmental map, the step status makes clear the skills achieved and the skills to focus on for the next developmental period. STEP is clearly well conceived, empirically developed and tested, and draws on the professional observational skills of the teacher. The step numbers provide a reference frame for student development (notwithstanding the non-equal increments). However, particularly in the beginning stages the step increments are large. The developers acknowledge as much:

It should be noted that it may be possible to write additional texts that fall between Step 3 and Step 4 in difficulty. However, such fine-grained, formal assessment of text was not chosen because the information acquired is intended for classroom teachers. These smaller distinctions may prove very useful for one-on-one tutoring (such as Reading Recovery) but for thinking about instruction for small groups or whole classrooms such detail may be overwhelming. (Kerbow & Bryk, 2005, p. 51 footnote)

Overwhelming maybe, but perhaps also required somewhere in the teacher's kit if the knowledge of the within step progress status can assist the teacher decide what to do next. The almost 2 logit step increment offers the 'real estate' at least for considering some appropriately targeted early texts, although at this early stage 'reading' as such is very rudimentary. Figure A9.2 provides some insight into the development of pre-reading skills, similar to the number word development illustrated in the CEM example (Appendix 8). The items are the letters and sounds of the alphabet in difficulty order, with upper and lower case letters identified separately.

Figure A9.2 Overview of STEP Letter Identification and Letter Sound Item Maps (from Figure 5, Kerbow & Bryk, 2005)



Like the number map the letter map indicates the letters likely to be identified first. On the basis of the map O is the first letter and the first upper case letter identified. The lower case version is harder but is the second easiest letter to identify. B precedes A in upper case. The second lower case letter is x.

The range of difficulties is 7.0 logits from upper case O to lower case q. This is a wide range of difficulties, reflecting how hard it is for young children to master the alphabet as a prior step to reading. Confusing for the student is the differing order to vocalise the letters. Z and P are two thirds along the identification scale (that is relatively hard to identify) but the easiest to sound. The hardest to sound out is e, assumed because of the variety of sounds associated with the letter.

STEP provides an example of the combination of scale development and skill learning relationships on a common scale and the complexity of scale increment decisions. In particular the example illustrates the ways in which learning-task expected-development order can be established empirically. The empirically ordered items provide a framework for

structuring the learning, a framework for monitoring the learning and a scale with potential for adding finer resolution to the 'intra level zones' in levelled curricula. On the basis of the steps descriptions the upper end steps have a 0.52 logit increment between them (see Figure A9.1) while at the lower end this is 1.75 logits. It is clear from the STEP example, and the other examples in the trajectories chapter, that early learners move through large logit differences in skills development. The relative difficulties of the early learning elements (letters, numbers sounds) from easiest to the most difficult are wider than later Year level differences. Criteria made specific for teachers (based on the STEP type analysis) might increase the observation and assessment skills for these teachers providing them with a scale reference for documenting student learning development.

The general order of alphabet learning is corroborated by Justice, Pence, Bowles and Wiggins (2006). The correlation coefficient for the learning order for names of the 26 letters with the order in Figure A9.2 is 0.85 (n=339 students for Justice et al.).