



How To: Match the Student to the Right Academic Intervention with the Instructional Hierarchy

Teachers recognize that learning is a continual process of growth and improvement. The student who grapples with the rudiments of a skill such as reading appears very different from the more advanced student who is a proficient and self-motivated reader. Intuitively, then, educators understand that students advance through predictable stages of learning as they move from novice to expert in a particular skill.

The Common Core Standards, too, acknowledge advancing levels of learning, as can be seen in their wording. For example, a 6th-grade Common Core Standard for Mathematics on the Number System (CCSM.6.NS.2) states that the student will "fluently divide multi-digit numbers using the standard algorithm." (National Governors Association Center for Best Practices et al., 2010; p. 42). This standard assumes that the successful student is both (1) accurate and (2) proficient (i.e., fluent) in multi-digit division--and implies as well that the student (3) will retain the skill over time, (4) will have the endurance to complete grade-appropriate tasks that include the skill, and (5) can flexibly apply or generalize the skill to those situations and settings in which multi-digit division will be useful.

The Instructional Hierarchy-IH (Haring et al., 1978) is a helpful framework to analyze stages of student learning. The Instructional Hierarchy breaks the learning process into several levels, shifting from skill acquisition through skill mastery toward full integration of the skill into the student's academic repertoire. As presented here, the Instructional Hierarchy consists of 5 levels (Haring et al., 1978; Martens & Witt, 2004): Acquisition, fluency, retention, endurance, and generalization. Although initially formulated several decades ago, the Instructional Hierarchy is widely used as a model of learning in contemporary research into effective instruction and academic intervention (e.g., Ardoin & Daly, 2007).

By linking a particular student's target skill to the corresponding IH learning stage, the teacher can gain insight into what instructional supports and strategies will help that student to attain academic success. This linkage of learner to learning stage increases both teacher confidence and the probability for a positive student outcome. The table below (adapted from Haring et al., 1978 and Martens & Witt, 2004) gives instructors a brief description of each learning stage in the Instructional Hierarchy, along with suggested instructional strategies and a sample intervention idea:

1. Acquisition

Goal. At the beginning of the acquisition stage, the student has just begun to acquire the target skill. The objective is for the student to learn how to complete the skill accurately and repeatedly--without requiring the help of another.

Instructional Strategies. When just beginning a new skill, the student learns effectively through learning trials, in which the teacher: (1) *models* how to perform the skill, (2) *prompts* the student to perform the skill; and (3) *provides immediate performance feedback* to shape the student's learning in the desired direction. The teacher can maintain student motivation by providing frequent 'labeled praise' (that is, praise that specifically describes the student's positive academic behaviors and effort) and encouragement. As the student becomes accurate and more independent in the skill, the teacher can gradually fade prompting support.

Sample Intervention Idea. *Cover-copy-compare* is a student-delivered intervention that promotes acquisition of math-facts or spelling words (Skinner, McLaughlin, & Logan, 1997). The student is given a blank index card and a worksheet with spelling words or math-facts (with answers) appearing in the left column. One at a time, the student studies each original model (spelling word or math fact), covers the model with index card, from memory copies the model (spelling word or math-fact equation and answer)



into the right column of the worksheet, then uncovers the model to confirm that the student work is correct. NOTE: This intervention is most appropriate for use as the student has acquired some accuracy and independence in the target skill.

2. Fluency

Goal. The student who advances into the fluency stage can complete the target skill with accuracy but works relatively slowly. The objective is for the student to maintain accuracy while increasing speed of responding (fluency).

Instructional Strategies. The student who has acquired the skill but must become more proficient benefits from (1) brief, frequent opportunities to practice the skill coupled with (2) instructional feedback about increasing speed of performance (Martens & Witt, 2004). To facilitate fluency-building, the teacher structures group learning activities to give the student plenty of opportunities for active (observable) responding. The student is also given multiple opportunities for drill (direct repetition of the target skill) and practice (combining the target skill with other skills to solve problems or accomplish tasks). The student receives feedback on the fluency and accuracy of the academic performance, as well as praise and encouragement tied to increased fluency.

Sample Intervention Idea. An example of a group strategy to promote fluency in math-facts is *explicit time drill* (Rhymer et al., 2002). The teacher hands out a math-fact worksheet. Students are told that they will have 3 minutes to work on problems on the sheet. The teacher starts the stop watch and tells the students to start work. At the end of the first minute in the 3-minute span, the teacher 'calls time', stops the stopwatch, and tells the students to underline the last number written and to put their pencils in the air. Then students are told to resume work and the teacher restarts the stopwatch. This process is repeated at the end of minutes 2 and 3. At the conclusion of the 3 minutes, the teacher collects the student worksheets.

3. Retention

Goal. At the start of the retention stage, the student is reasonably fluent but is at risk of losing proficiency in the target skill through lapses in use. At this point, the objective is to 'overlearn' the skill to insure its retention even after long periods of disuse.

Instructional Strategies. Frequent opportunities for practice can be an effective method to entrench a skill and help the student to retain it over time (Martens & Witt, 2004). The teacher can schedule numerous practice episodes within a short time ('massed review') to promote initial fluency and then reinforce longer-term retention of the skill by scheduling additional periodic review ('distributed review') across longer spans of several weeks or even months (Pashler et al., 2007).

Sample Intervention Idea. An illustration of an intervention to promote retention is *repeated reading* (Lo, Cooke, & Starling, 2011). This intervention targets reading fluency: The student is given a passage and first 'rehearses' that passage by following along silently as the tutor reads it aloud. Then the student reads the same passage aloud several times in a row, with the tutor giving performance feedback after each re-reading. If a teacher uses a fluency-building strategy such as repeated reading but sets an ambitious outcome goal that is *above* the minimum benchmark for success, the resulting 'overlearning' can support long-term retention of the skill. For example, a 4th-grade teacher uses repeated reading with a student during a mid-year intervention and tracks the student's reading fluency using timed 1-minute curriculum-based measurement oral reading fluency passages. Benchmark norms (Hasbrouck & Tindal, 2005) suggest that the student will cross over into the 'low-risk' range for reading fluency if he can read at least 87 words



per minute according to the mid-year benchmark norms for grade 4. The teacher decides instead to overshoot, setting the outcome goal to a higher 95 words per minute ('overlearning') to give the student an additional margin of reading fluency to promote long-term skill retention.

4. Endurance

Goal. At the onset of the endurance stage, the student has become fluent in the target skill but will engage in it only reluctantly or for brief periods. The goal is to have the student persist in the skill for the longer intervals of time required in the classroom setting or expected for the student's age group. (Martens & Witt, 2004)

Instructional Strategies. Several instructional ideas can promote increased student endurance. In structuring lessons or independent work, for example, the teacher can gradually lengthen the period of time that the student spends in skills practice or use. The student can also be enlisted to self-monitor active engagement in skill-building activities--setting daily, increasingly ambitious work goals and then tracking whether he or she successfully reaches those goals. NOTE: If a student appears to lack 'endurance', the teacher should also verify that the fundamentals of good instruction are in place: for example, that the student can do the assigned work (instructional match), adequately understands directions, is receiving timely performance feedback, etc.

Sample Intervention Idea. An idea to increase student endurance provides breaks between gradually lengthening work intervals ('*fixed-time escape*': adapted from Waller & Higbee, 2010). This strategy can be used with groups or individual students. The teacher first selects a target activity for endurance-building (e.g., independent reading). The teacher then sets the length of work periods by estimating the typical length of time that the student or group will currently engage in the activity (e.g., 5 minutes) before becoming off-task or disruptive. The teacher also decides on a length for brief 'escape' breaks (e.g., 2 minutes)--times when students can stop work and instead take part in preferred activities.

At the start of the intervention, the teacher directs the student or group to begin the target work activity. At the end of the work interval (e.g., 5 minutes), the teacher announces that the student or group can take a short break (e.g., 2 minutes). When that break is over, students are directed to again begin work. This sequence (work interval, escape interval) repeats until the scheduled work period is over. As students are able successfully to remain engaged during work periods, the teacher can gradually extend the length of these work periods by small increments, while reducing and then fading escape breaks, until work periods reach the desired length.

5. Generalization

Goal. At the beginning of the generalization stage, the student is accurate and fluent in using the target skill but does not always employ the skill where or when needed. The goal of this phase is to motivate the student to apply the skill in the widest possible range of appropriate settings and situations.

Instructional Strategies. The teacher can promote generalization of skills by first identifying the types of situations in which the student should apply the target skill and then programming instructional tasks that replicate or mimic these situations. So the teacher may create lessons in which students can generalize the target skills by interacting with a range of people, working with varied materials, and/or visiting different settings. The teacher can also use explicit prompts to remind students to apply skills in specific situations.

Sample Intervention Idea. For a student who does not always generalize the skill of carefully checking math assignments before turning them in, the teacher can work with that student to create a math *self-*



correction checklist (Uberti, Mastropieri, & Scruggs, 2004). Teacher and student meet to create a checklist of that student's most common sources of errors on math assignments. The student is then expected to use the checklist to review math work before submitting to the teacher. This intervention strategy can be adopted to other disciplines (e.g., writing assignments) as well. And completed checklists can be collected with assignments to verify student use.

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