By: Multiple Contributors

This blog post pulls from chapter three of our book, Teaching Math for All Learners: Teaching educators to use effective strategies to help all children learn math.

When All Learners Network (ALN) created the High Leverage Concepts (HLCs), we focused on the most critical concepts to ensure that all students would have access to the opportunities that success in math facilitates. At each grade level, we asked the questions:

- *Which concepts, or big ideas, have the most leverage for future success?*
- *What would a student have to understand in one grade to be successful in the next?*

To provide equity to students, and to close existing achievement gaps with students of color, students from poverty, and students with IEPs, all students need to know some mathematics, particularly algebra (Snipes, Finkelstein, Regional Educational Laboratory West (ED) & WestEd, 2015). However, not all the math identified in the Common Core State Standards (CCSS) leads to algebra. For this reason, we would argue that some math is more critical to learning algebra and the potential opportunities that come with it. In particular, what the National Council of Teachers of Mathematics (NCTM) refers to as numbers and operations, is often considered the essential math content to lead to algebra and beyond (Wilson, 2009). The ideas that flow in the HLCs are a learning trajectory that leads, ultimately, to algebra. For students who have learning challenges and/or struggles with mathematics, the HLCs can provide a clear path for intervention and a direction for focus.

Why is an emphasis on focus and continuity so important?

These are two elements that create real opportunities for equity because these concepts help keep students' and teachers' attention on what's most important. Imagine a baseball program for children where some players were only allowed to wear a team's uniform, but they were never allowed to play. In this scenario, the majority of a team's players would practice together and play games. But a small minority would only be allowed to watch - occasionally. Most of their baseball time would be spent on a separate field, with a different coach (who never spoke with the team's manager) practicing discrete skills. These few "special" players would spend their time swinging the bat, running around the bases, and playing catch. They would never have the opportunity to play in a game or understand how the skills they were learning fit into real baseball.

This is a strong analogy for the experience of students with learning differences when it comes to learning mathematics. They don't get opportunities to "play a real game", to do real mathematics. When we introduce HLCs into this experience everyone -- the teacher, the special educator or interventionist, and the student –- knows what the important goals are. There is also a clear path from one concept to the next. In this context, learning math in the general education classroom becomes a bit more straightforward. By focusing more on what matters most, we create opportunities for all learners to "play." This is a chance for students, even students with learning challenges, to do "real math" (problem-solving, applied tasks) rather than spending all their instructional time on discrete skills. By focusing on real math, we introduce the needed rigor into programs for students with learning differences. There are real benefits to doing this, as cognitive capacity cannot be built through repetition. It comes from solving problems.

What are the HLCs?

The High Leverage Concepts (HLCs) act as a roadmap, offering the user a chance to know a little more about where they are and where they're going. The HLCs are a tool to facilitate focus and continuity by providing clear guidelines about what matters most, and effective tools for teaching these concepts. An HLC is broader than a standard, like those in the CCSS, although they are connected. In general, though, HLCs are aimed at deep conceptual understanding of key mathematical concepts. They imply that a student can demonstrate their understanding using a conceptual model.

For example, the HLC for Grade 1 states:

- *Understanding of number values and sequences to 120 (cross century, cross decade)*
- *Understanding place value when adding and subtracting numbers within 100 (in context and in equations)*

The big idea for first grade is for students to deeply understand additive reasoning with whole numbers within 120. This is the "elevator speech" for first grade about what's most important for everyone to understand. It's the minimum expectation for every child leaving first grade. The minimum. By drawing a line in the sand around a particular essential concept, teachers can ensure that there is equity as students move to second grade.

But aren't all the concepts in each grade's curriculum important?

A comprehensive curriculum is important. A comprehensive curriculum is built as though all math concepts and understandings at each grade level are equally important. We know that they are not. Algebra, for example, is a good predictor of high school graduation and college and career readiness. Understandings that lead to algebra will create more opportunities for students as they progress through the grades. In the long term, those understandings are more important.

Why not just teach the HLCs?

Because the HLCs at each grade level are minimum understandings. They are like saying, "If a child only really understands one or two things at a grade level, what should those things be?" The HLCs are not, and do not profess to be a curriculum. The CCSS offers a comprehensive approach to specific, testable math understandings. Curriculums based on standards like these are important for students to develop a complete understanding of mathematics.

References

Huang, C. W., Snipes, J., & Finkelstein, N. (2014). Using Assessment Data to Guide Math Course Placement of California Middle School Students. REL 2014-040. Regional Educational Laboratory West.

Wilson, W. Stephen, "Elementary School Mathematics Priorities." American Association of School Administrators: Journal of Scholarship and Practice, Spring 2009 / Volume 6, No. 1

What Now? Scan the QR code and scroll to the bottom of the post for links to next steps

1. Continue learning about the High Leverage Concepts (HLCs) through our resources and our free book
2. Explore the High Leverage Concept Learning Progressions and the High Leverage Assessments
3. Bring All Learners Network (ALN) into your school or district for embedded professional development