Principles of Scientific Based Research in MobyMax

Students who have spent just 40 hours using MobyMax average a 1.5 grade-level increase in both math and language. These results are due largely to MobyMax’s pedagogy, which incorporates multiple research-based techniques that have proven highly effective in increasing student achievement.

MobyMax’s pedagogy and curriculum system incorporate the most effective practices for increasing student outcomes as identified by Professor John Hattie’s exhaustive research of over 800 meta-analyses.

Chart is based on Professor John Hattie’s research that synthesized over 1,000 meta-analyses of over 50,000 studies.

Formative testing*  0.90
Accelerated curriculum*  0.88
Immediate feedback*  0.73
Direct instruction*  0.59
Parental involvement*  0.51
Writing programs*  0.44
Homework*  0.29
Summer school  0.23
Class size  0.21
Summer vacation -0.09
Television -0.18

*All part of MobyMax’s curriculum system

Effect Size Measures Achievement
An effect size of 0.40 means a student made one year’s progress within one school year. A teacher normally has an effect size ranging from 0.20 to 0.40.

Learning accelerates > 0.40
Progresses one grade level = 0.40
No effect on learning = 0.00
Negatively affects learning < 0.00

Consistent MobyMax Results

Built on the back of research that identifies what works best for students and teachers, MobyMax’s pedagogy has produced consistent gains in student achievement in both math and language over the past 2 years.
Accelerated Curriculum

Moving gifted students through the curriculum at an accelerated rate has been shown to yield significant gains in student achievement (Kulik and Kulik, 1984). Acceleration vastly outperforms enrichment in terms of student outcomes for gifted students, and some research suggests that this effect may extend to non-gifted students as well. MobyMax capitalizes on this research by differentiating learning for each student, filling in any gaps in student learning first and then allowing the student to move through the curriculum at an individualized pace. When a student fails to master material, they receive remedial instruction, and conversely, when a student is able to demonstrate rapid mastery, they are able to move forward more quickly.

Immediate Feedback

After reviewing 8,000 studies John Hattie (1992) concluded, “The most powerful single modification that enhances achievement is feedback. The simplest prescription for improving education must be ‘dollops of feedback’.”

The timing of feedback has proven to be very important, with immediate feedback proving to be the most effective. In addition, specific feedback, such as the specific explanations that accompany every problem in MobyMax, has been proven to enhance achievement.

Direct Instruction

Direct instruction is frequently confused with rote memorization and repetitive drill, both of which can be boring and negatively affect student outcomes. However, direct instruction, when implemented correctly, has been proven to foster significant gains in student achievement and result in deep and enduring understandings (Pélaudeau, Forget & Gagné, 2003). Direct instruction involves providing a discrete learning target with success criteria, implementing clear modeling and guided practice, and offering ample and varied opportunities to practice and extend a specific skill while providing useful feedback. MobyMax excels at harnessing the power of direct instruction by breaking down standards into clear learning objectives for students, providing easily understood instruction in the form of teach me lessons, and presenting students with multiple experiences to practice and develop a deep understanding of specific skills while providing high-utility feedback throughout the learning process.

Parental Involvement

Research indicates that the influence of a student’s home life varies widely with respect to student achievement. However, high parental expectations have consistently been shown to be one of the strongest indicators of increased student achievement (Hung & Ho, 2005). MobyMax’s parent portal
Goal Setting

Research shows a consistent, positive relationship between setting goals and successfully performing tasks. To this end, MobyMax integrates IEP goals directly into the student’s curriculum and data reporting.

Simple Cognitive Skills

From academia to professional sports training, cognitive theory recognizes that complex knowledge is composed of simple cognitive skills and that the most efficient way to learn any complex skill is to practice each of the small, discrete skills that compose the complex task.

MobyMax’s curriculum breaks complex skills into small, achievable sub-skills, spiraling knowledge throughout a lesson to achieve eventual mastery of complex skills. This pedagogy has been shown to not only increase achievement, but also improve confidence and motivation as students master each individual sub-skill.

Fact Fluency

Basic concepts like addition, subtraction, multiplication, and division are the foundation for more complex math procedures. The National Math Panel’s “Foundation for Success: Final Report” (2008) advocates that all students develop automatic recall of math facts in order to be prepared adequately for higher level math. MobyMax has incorporated fact fluency directly into its curriculum and has also created a standalone fact master module that ensures students get the practice necessary to achieve automatic recall of all math facts.

Student Data

Using data to inform instructional decisions leads to improved student outcomes (Wayman, 2005; Wayman, Cho, & Johnston, 2007; Wohlstetter, Datnow, & Park, 2008). MobyMax allows all parties involved in a student’s education, including the student, to easily access student achievement data. MobyMax continuously monitors student progress with regard to mastery of the CCSS standards and displays the data in multiple, easy-to-interpret formats.

Additional Research Citations

Formative Assessment


Immediate Feedback

Krause, Ulrike-Marie (2009). The effects of cooperative learning and feedback on e-learning

Opitz, Bertram (2011). Timing Matters: The Impact of Immediate and Delayed Feedback on Artificial Language Learning

Li, Shaofeng (2010). The Effectiveness of Corrective Feedback in SLA: A meta-Analysis

Feyzi-Behnagh (2012). The Effectiveness of a Pedagogical Agent’s Immediate Feedback on Learners’ Metacognitive Judgments during Learning with MetaTutor


Epstein, Michael (2002). Immediate Feedback Assessment Technique Promotes Learning and Corrects Inaccurate First Responses

Epstein, Michael (2006). Adjunctive role for immediate feedback in the acquisition and retention of mathematical fact series by elementary school students

Samuels, S. Jay (2010). The Effects of Immediate Feedback on Reading Achievement

Direct Instruction


Parental Involvement
Systematic Review


Smith, Troy A (2010). Learning from feedback: Spacing and the delay-retention effect


Goal Setting

Moeller, Aleidine J. (2012). Goal Setting and Student Achievement: A Longitudinal Study

Murayama, Kou (2009). The joint influence of personal achievement goals and classroom goal structures on achievement-relevant outcomes

Wilson, Kristin (2012). A study on student achievement of classes that set goals and self-monitor their achievement

Shannon, King R. (2011). Examining the role of goal setting and self-monitoring on sixth grade students’ motivational beliefs and performance

Smithson, Marla (2012). The positive impact of personal goal-setting on assessment

Stronge, James H. (2009). Student achievement goal setting: Using data to improve teaching and learning

Hamilton, Laura (2009). Using student achievement data to support instructional decision making

Patel, Namisha (2012). Utilizing goal setting strategies at the middle level: Helping students self-regulate behavior