Research Shows That Developing Meta-Cognitive Skills Creates Stronger Thinkers and Better Students

When used in a school setting, cultivating meta-cognitive skills encourages children to *think about how they think*—and it helps them become better learners.

In fact, recent research has shown that working on meta-cognitive skills offers children significant benefits both in the classroom and beyond. Below, we've compiled scientific research on seven critical meta-cognitive skills to demonstrate the effects of developing these skills through learning platforms such as GoGo Brain.

Optimizing Listening Skills Creates Strong Teacher/Student Relationships and Nurtures a Love of Learning

Research has shown that strong listening skills promote effective relationships between teachers and students. These skills also build an appreciation and interest for the material that a teacher presents (Gulec & Durmus), nurturing a lifetime interest in learning.

In a recent study, researchers hypothesized that it's possible to optimize learning when children are taught to listen effectively. Their research focused on a population of kindergarten students whose curriculum focused on foundational skills such as listening comprehension (Brigman & Webb). As part of the listening curriculum, students were taught how to listen for the material's main idea, as well as how to ask questions.

Students who received listening training demonstrated stronger improvement on the Listening Comprehension Subtest of the Stanford Early School Achievement Test than those who did not undergo training (Brigman & Webb). Most importantly, this research demonstrates that listening is a malleable skill that can be developed inside and outside the classroom.

Source: “Ready to Learn: Teaching Kindergarten Students School Success Skills.”

Learning to Follow Directions Increases Student Classroom Involvement and Supports Future Academic Development

A recent study investigated whether students with a strong ability to follow directions are likely to be more involved and active within classroom discussions and activities. Following directions is not only important in the classroom, but in the home as well. Like teachers, parents also serve as instructors in developing and motivating performance of this skill set.

The study presented parents with a line drawing while their children were placed in a separate room. Parents were asked to record directions to help their child reproduce the same drawing on an Etch-a-Sketch. The results revealed that children can improve their

ability to follow directions. This, in turn, equips these students, for example, to follow the requirements for an assignment a teacher offers in the classroom, setting them up to excel academically.

In summary, fostering the ability to follow directions is a dynamic process that provides students with the cognitive tools to develop and mature academically (Stright et al.).

Source: "Instruction Begins in the Home: Relations Between Parental Instruction and Children's Self-Regulation in the Classroom."

Increasing Self-Control Helps Students Reach Higher Levels of Academic Accomplishment in Math, Literacy and Vocabulary

Behavioral regulation, or self-control, is critical for classroom success. These skills include things like staying focused, maintaining control of one's impulses in the classroom and utilizing working memory, which helps children hold on to information long enough to use it.

Researchers Matthews, Morrison, and Ponitz designed a study to determine whether self-control could be directly connected to academic success, as defined by achievement in end-of-kindergarten mathematics, literacy, vocabulary achievement and the teacher's overall assessment of student progress.

The team created a Head-Toes-Knees-Shoulders (HTKS) task as a means of measuring behavioral regulation among these kindergarten students. All students were instructed to express the opposite of the most common response to a series of four different verbal commands. In order to succeed, students had to apply three cognitive skills: 1) focusing on instructions and commands, 2) utilizing working memory to remember rules and 3) inhibiting their automatic response while still responding correctly.

The study ultimately revealed that students who had higher levels of behavioral regulation at the start of kindergarten achieved higher levels of mathematics, literacy, vocabulary skills and teacher-rated classroom based behavioral regulation in the Spring (Matthews, Morrison, and Ponitz).

Source: "A Structured Observation of Behavioral Self-Regulation and Its Contribution to Kindergarten Outcomes"

Honing Student Focus Primes School Readiness and Lays a Foundation for Strong Classroom Engagement Skills

Attention and focus in the classroom can be highly predictive of a student's success and achievement. Specifically, *kindergarten attention is regarded as the most critical predictor of first and third grade math and reading achievement*, as well as overall school readiness.

Even during the pre-school years, attention skills provide children with a foundation of strong self-control (Mischel et al.). In a study by Pagani, Fitzpatrick and Parent, researchers explored the relationship between children's kindergarten attention skills and subsequent development of classroom engagement, including self-control, persistence, organization and the ability to engage in both independent and collaborative work (McClelland et al.). The results of the study revealed that kindergarten is a crucial time for developing classroom engagement skills (Pagani, Fitzpatrick, and Parent).

By strengthening focus and attention, children are more likely to demonstrate better productivity and classroom behavior. The study also demonstrated that attention is a malleable skill that children, parents, and educators can begin targeting early on as a means of opening the doors to a successful academic career.

Sources:
"Relating Kindergarten Attention to Subsequent Developmental Pathways of Classroom Engagement in Elementary School."

"Motivation and Performance in a Game-Based Intelligence Tutoring System."

Strengthening Working Memory Boosts Math and Reading Performance

Research has demonstrated strong connections between working memory—the ability to hold information in one's head long enough to use it—and academic achievement among children (Bourke & Adams, 2003). Working memory aids with reading comprehension success in children. It also provides the foundational basis for skills that are critical for reading fluency and comprehension.

In one study, researchers examined whether working memory contributes to reading and math achievement scores, using standardized test scores as the specific measure.

Findings revealed that working memory contributed to both math and reading performance. Specifically, under the umbrella of reading achievement, working memory assisted with superior scores on reading fluency and passage comprehension. Additionally, working memory promoted higher scores on math fluency and calculation skills (Blankenship et al.).

Source: "Working Memory and Recollection Contribute to Academic Achievement."

Improving Visual Spatial Reasoning Fosters Achievement in Math and Sciences

Throughout a student's educational career, visual spatial reasoning remains one of the most critical forms of thinking to develop. This complex and unique skill involves

“visualizing, interpreting, and reasoning in both two dimensional and three dimensional spaces” (Sinton 2012).

Most notably, spatial thinking is related to achievement in the math and sciences (Battersby, Golledge, & Marsh, 2006*).*

In a progressive study by Chabani and Hommel, experimenters assessed whether visual spatial reasoning could be targeted and improved. They utilized the Chinese Tangram game to reinforce visual-spatial skill sets. Tangrams help students to develop “knowledge, reasoning, geometrical imagination, development of creative thinking, including the understanding of geometrical shapes, size, and position in space” (Chabani & Hommel). *The results demonstrated that visual training improved performance on future visual-spatial reasoning tasks* (Chabani & Hommel).

Source: "Effectiveness of Visual and Verbal Prompts in Training Visuospatial Processing Skills in School Age Children.”

Utilizing Multimedia Training Improves Academic Performance, Motivation, Creativity and Self-Control

Educating students through multimedia has significantly altered how students learn. Numerous research studies supported the idea that a multimedia education improves students’ academic performance in science, mathematics as well as literacy (Gee, 2003).

Specifically, computer-assisted instruction curriculums have the potential to motivate, challenge and improve creativity and control amongst children. In a study by Chuang and Chen, researchers examined whether computer-based video games enhance children’s cognitive learning achievement. All students in the experimental condition were exposed to a game called “Fire Captain,” where they had to learn all the skills necessary to put out a fire.

The results revealed that computer-based video games have the potential to improve and facilitate students' critical thinking and higher-level cognition. The computer game strengthened students’ fact differential/recall processes, as well as their problem-solving skills. The results also revealed that participants’ learning comprehension knowledge was improved, due in part to the problem-solving and strategy skills that were put to the test.

Ultimately, according to the study, computer-based video games can be considered an effective and interactive approach to classroom instruction. Such educational games have the potential to enhance higher-order thinking, factual knowledge, as well as problem-solving skills (Chuang & Chen).

Source: "Effects of Computer-Based Video Games on Children: An Experimental Study.”