

Play. Code. Create



Traditional Setting KOOV Case Study

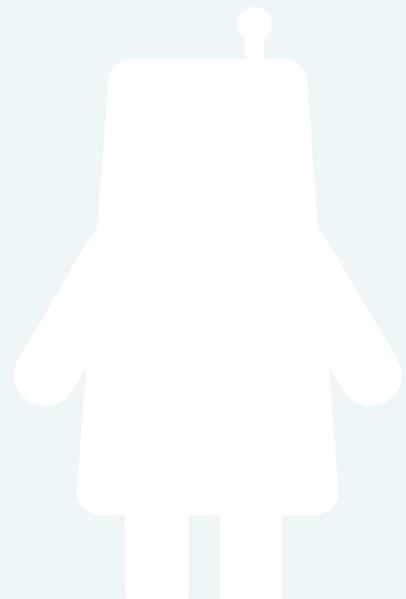
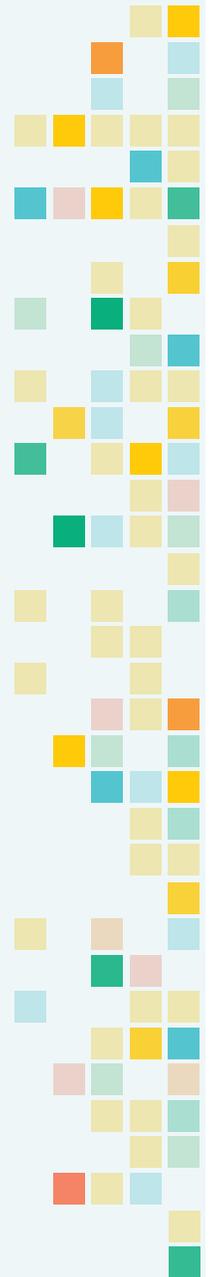
Morris Grade School, Morris, IL
La Costa Heights, Carlsbad, CA
Ewa Makai Middle School, Ewa Beach, HI
Monroe Township Middle School, Monroe, NJ
Orange Glen HS, Escondido, CA
Toland Way Elementary, Los Angeles, CA
San Marcos HS, San Marcos, CA
Hugh Mercer Elementary, Fredericksburg, VA
Madison Middle School, Oceanside, CA
Mission Estancia Elementary School, Carlsbad, CA
Anton Grdina School, Cleveland, OH

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Background

These schools all received KOOV prototype kits to use in their classrooms. Over the pilot program period, all the activities had different group sizes and implementation uses for KOOV. This paper is a comprehensive look at how makerspaces and after school programs incorporated this product into their teaching of coding & robotics.

The participants were asked to observe the students' experiences and give their own thoughts with KOOV, and at the end of the program provide feedback via a survey and an exit interview.

Sony Electronics implemented the KOOV Pilot Program to capture insights and feedback from educators as they look to bring KOOV to the United States.

Pilot Program Participants

Molly Kaminski, Morris Grade School

Sandra Chapman, La Costa Heights

Miki Cacace, Ewa Makai Middle School

Donna Montgomery, Monroe Township Middle School

Betsy Lee, Orange Glen HS

Anne Brubaker, Toland Way Elementary

John Greenway, San Marcos HS

Denise Phipps, Hugh Mercer Elementary

Jared Montgomery, Madison Middle School

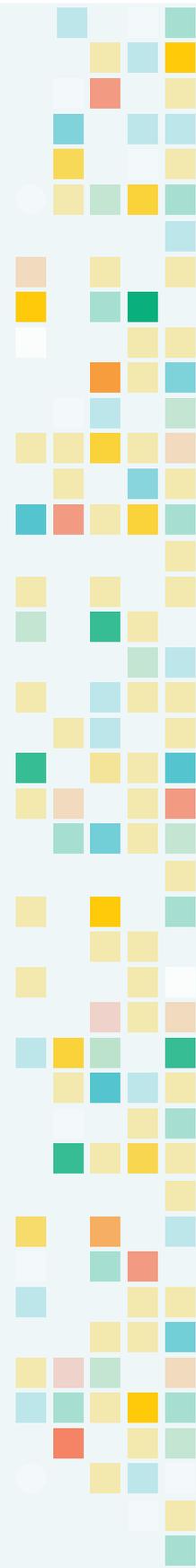
Kelly DiMarco, Mission Estancia Elementary School

Karen Muhammed, Anton Grdina School

STEM: Building the Foundation for Our Young Learners

Early literacy is often portrayed as the earliest indicator of academic success; however, studies have shown that STEM concepts fit with young learners' inquisitive minds and help to develop logic and reasoning. A foundation of STEM in grades K-3 specifically will pay off for future learning of the students who experience STEM learning at a young age.

Speaking specifically to the need for early math, Greg Duncan, an economist and University of California Irvine education professor, found that, "Math coming into school is important because **kids who do well in math early on tend to do very well in school.** And math is important later on because **kids who do well in math in high school end up doing well in the labor market.**" Duncan also notes that his research shows, "The links between school success and achievement in, say, 5th grade or 8th grade, and the kind of skills that kids bring into school. It's a pattern that seems to be showing up in a number of different data sets from several different countries and different historical periods." Through research like Duncan's, the **need for STEM to be introduced in younger grades is clear.**

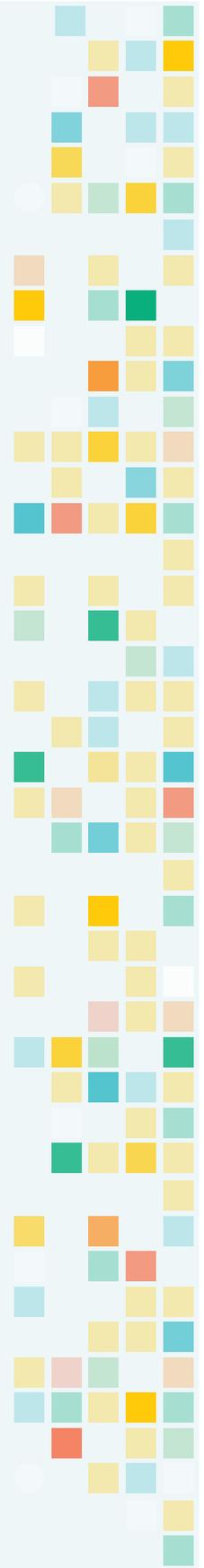


Barriers to Introducing STEM for K-6

The tipping point from early adopters to mainstream for introducing STEM at early ages has happened. Most districts buy into the idea that young learners need to be introduced to these concepts, but it's **still a challenge to figure out how to do it.**

The first challenge can be convincing K-6 teachers that they can teach coding and robotics. Molly Kaminski of Morris Grade School notes that, **“Teachers need no knowledge of coding or robotics to successfully implement KOOV”**. Picking a product and support team to help educators be comfortable with new materials is critical to the success of the learning. If schools are not careful about the tools they use for STEM early on, there is potential to turn off an entire grade or more to science, technology, engineering, and mathematics. Sandra Chapman of La Costa Heights Elementary School stated that, **“I can’t begin to tell you how much my students have grown and how engaged and enthusiastic they are to build, code, and design.”** **Enthusiasm and engagement is what will attract and maintain students’ interest in STEM.**

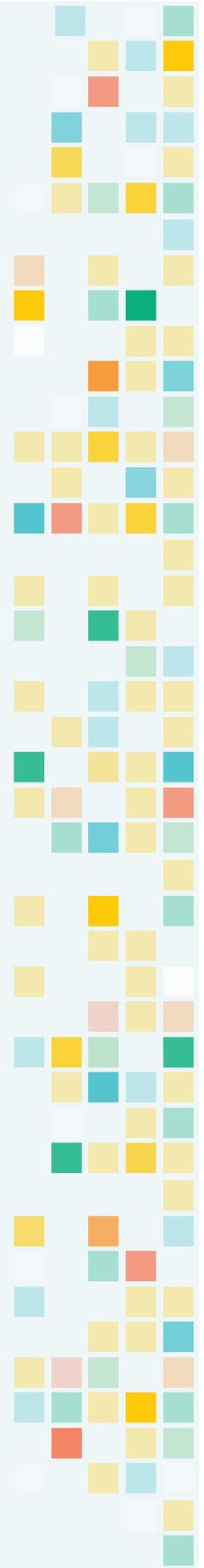
There is also a public perception that STEM learning concepts are reserved for the older grades in middle and high school or for those in a talented and gifted program. This perception can come from the idea that STEM concepts are complex and too challenging for young learners; however, it’s simply not true. Molly Kaminski notes that “KOOV was extremely easy to implement in the classroom, that’s what teachers want because students are so hands-on and learned to problem solve in the classroom. This can be totally student-centered”. Often when thinking about student-centered learning, it’s easy to start thinking about older students. KOOV provides an easy-to-implement program for skeptical teachers and student-centered learning especially for grades P-3.



Why STEM must be Introduced Early

While STEM is important in middle school, high school, and talented and gifted programs, there is a true value add to introducing STEM in elementary schools. Studies by the National Science Teachers Association show that, **“Young children learn through active exploration—and the drive to observe, interact, discover, and explore is inherent in their development. And it is during these years that many in the education community believe that evidenced-based STEM curricula should begin, setting children on a path to develop a love of scientific inquiry.”** Not only that, but The National Science and Technology Council, along with the Committee on STEM Education, the National Association for the Education of Young Children, and the Next Generation Science Standards concur that, **“The exposure to STEM during early childhood is critical to establishing an optimal educational trajectory.”**

The University of Nevada, Las Vegas notes that, **“Play-based curriculum has shown to be a particularly effective method for early learning.** These practices can be directly applied to STEM and the scientific inquiry process and can be embedded across routine activities that are already of interest to children or are part of their daily functional routines.” **KOOV allows students to play,** and as Denise Phipps of Hugh Mercer Elementary notes, “KOOV exceeded my expectations on what my kids were able to do”. **If we give young learners the space to explore and play, the world will continue to be shocked at what they can do.**





Policymakers are also realizing the need to introduce STEM opportunities especially for P-3 students. According to the National Conference of State Legislatures, “Of the bills introduced and enacted between 2015-2017 sessions that include P-3 grades, most **funded development of new programs such as STEM centers, curriculum and standards and grant programs.** Bills also addressed teachers, including professional development, salaries, and incentives for specializing in a STEM field.”

Now is the time to introduce STEM concepts especially to P-3 grades. This shows benefits for educators, students, and even the future global economy. Find ways to integrate professional development for your teachers, create a communications plan for the community to understand why it’s so important, and most importantly, ensure you partner with the right programs and products to support nervous educators and students who are all beginning STEM concepts with different experiences and formative years. Find the partner who can meet students where they are and encourage and offer professional development for educators to cultivate and retain interest in STEM for a lifetime.

