

Engage me and I learn

Project-based learning presents an opportunity to engage both struggling students and high-achieving students.

By Eleanor K. Smith and Margaret Pastor

Mario arrived in 4th-grade with limited English, unable to read, and angry. Meanwhile, in the same class, Megan began the year reading on a high school level.

Two very different students with very different needs.

In education, we talk about reaching every student and personalizing the learning process. But moving these ideas from theory to practice requires re-examining the roles of both students and teachers to make personalization happen. Using projects enabled the 4th-grade classroom teacher and the special education teacher to successfully address these elements on a continual basis yielding results that went well beyond academic success. Students nurtured their own self-confidence as learners and risk takers. And, perhaps most important, they discovered the joy of learning.

Mario was a new arrival from another school district. Mario's file identified him as a non-reader and a special education student with extremely low academic scores. Additionally, as an ESOL (English for Speakers of Other Languages) student, the teachers questioned his ability to speak and understand English. The file also said Mario was a behavior problem. When we met him, he kept his head down and his hood up over it. When addressed, he would reluctantly look up to scowl at the speaker. We worried that Mario might need to be placed in an environment with more special education support than a regular classroom could provide

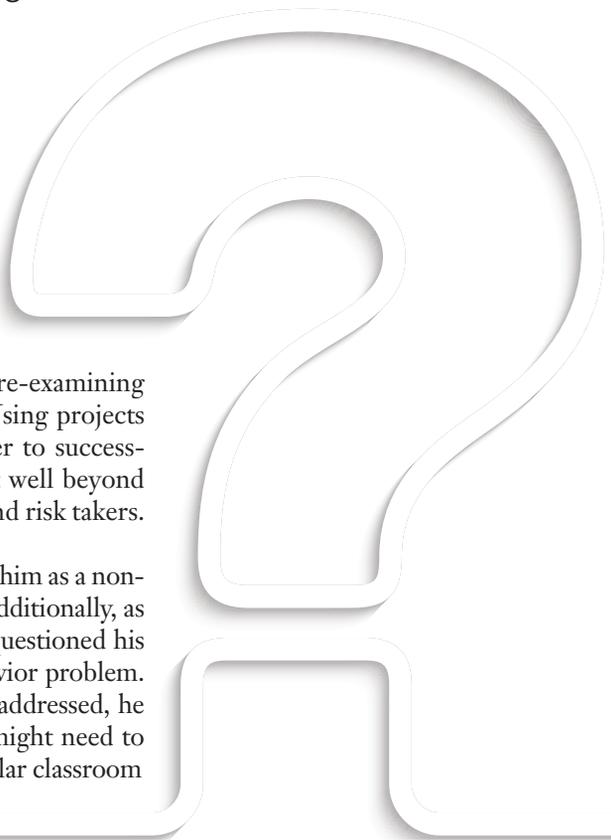
Megan was the near polar opposite of Mario: She had managed to get to 4th grade with almost perfect grades, completing worksheets and exams with nearly flawless scores. She knew exactly what was required in every subject, and she delivered every time. Megan, a native English speaker, was a well-behaved young lady, quiet, shy, and not a risk taker.

Coincidentally, Mario and Megan had arrived in 4th grade the year that our school decided to embark on project-based learning. We had experimented with projects the prior year with varying success, and one teacher had done a yearlong Opera Project that was a model for the rest of us. We decided to embark on project-based learning with a project that put United States geography at the center.

Mario picked the state of Texas as the topic area for his project. He quickly became engaged in posing questions and searching for answers to all manner of inquiry about the state — and the transformation was astonishing. We learned that he could indeed speak and understand English well; he simply had not cared to speak up in school. During 4th grade, he began to read for the first time. The biggest change, however, was in his behavior. The sullen child with a history of behavior problems became a happy, eager learner.

Meanwhile, Megan struggled to complete projects, confused by the idea that they did not have one, correct answer. Several times, it was Mario who coached her on how to approach projects. At one point, while creating a diorama, Megan remained stumped for two weeks because she could not figure out how to create the “perfect” diorama. One of the most capable students in the class had rarely been asked to creatively solve a problem.

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A high-achieving student learns to be more creative during project-based learning, and a struggling student flourishes when he's able to apply his knowledge in practical settings.

Reaching every student and personalizing the learning process requires re-examining the roles of both students and teachers to make personalization happen.

Moving on to Mars

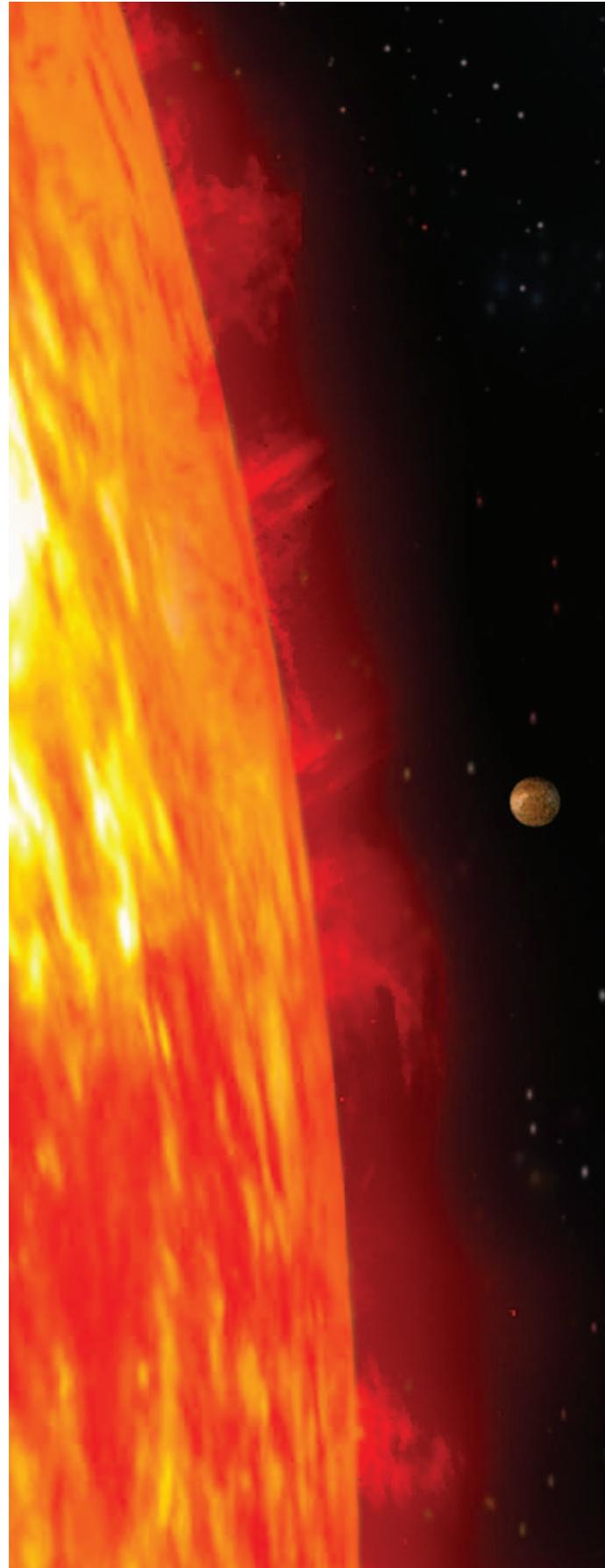
At the end of the year, the 4th-grade teacher was asked to move to 5th grade, and she asked to keep most of her class with her. The two teachers decided to incorporate a Martian Colony Project into the new 5th-grade classroom, a project conceived during the previous year.

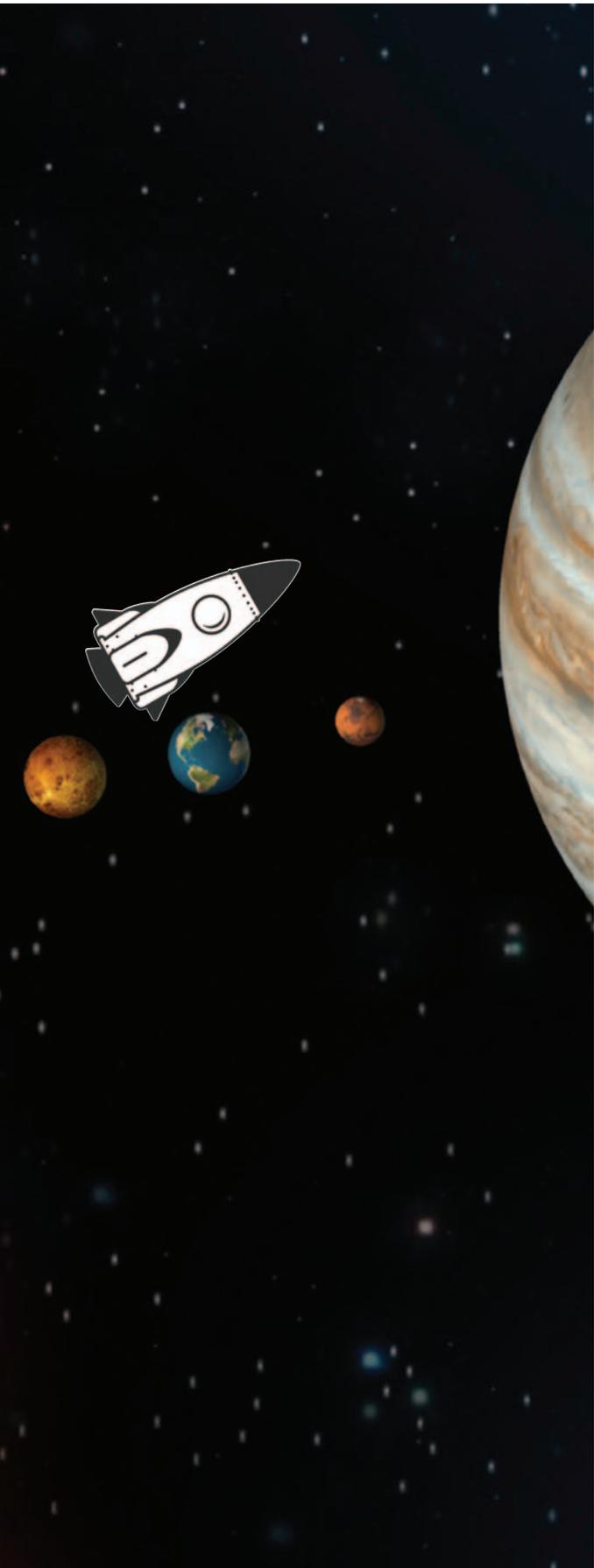
Mario entered 5th grade excited about the continuation of projects. He eagerly embraced the Martian Colony Project; Megan was cautiously excited as well. Teachers began the year by exposing students to as much information about Earth, Mars, and space as they could find. They read about Earth, Mars, and space in reading groups. They teleconferenced with space scientists and had guest speakers with expertise in geography and space exploration. They watched videos about Earth, Mars, and space. They took field trips, including a trip to the Smithsonian Air and Space Museum in nearby Washington, D.C.

In December, students began to design the Martian Colony. They divided a bulletin board into six-inch by nine-inch “pods,” using a scale of one inch to one foot. Students taped a six-foot by nine-foot area on the classroom floor to demonstrate the limited space in each pod. Each student and the teachers were assigned their own pod. They designated remaining pods for the technology needed to support life in the colony. The class developed a key using colored index cards, and students “furnished” their pods.

The colony quickly became “real” to students, including to Mario and Megan, as they researched and designed their own Martian Colony. Students gravitated to the colony bulletin board throughout the school day. At one point, Megan sought out the special education teacher to complain that her perfectly measured and scaled furnishings did not fit in her pod; upon investigation, she realized her pod was a half-inch short. She continued to explain that this half-inch represented six inches in actual scale, and this was “a lot of space to lose.” The teacher apologized but explained that this can happen in construction, and she would either have to work in the smaller space or change pods. After several days of collaboration with other students, Megan decided to keep her assigned pod but negotiated sharing part of her neighbor’s pod. The math, science, and social language the students used in labeling their work on the bulletin board and in discussing their pods exceeded what teachers had seen in previous 5th-grade classes.

Teachers realized that much of their teaching was now guided by casual student discourse while they worked on the pods and other displays. Questions and dialogue flowed, and teachers incorporated academic content into these student-led and student-owned conversations.





Survival lessons

As the class moved into what would be needed to survive on Mars, the science lessons multiplied exponentially. Students posted their ideas on an Idea Board, which was modeled after a picture of a whiteboard the class had seen in the background of a photo from the Mars Science Laboratory at NASA's Jet Propulsion Laboratory. Students also began incorporating personal interests into the colony. Surveys, supply lists, expense forms, and descriptive proposals filled the Idea Board.

Their enthusiasm spread, and soon students and staff from around the school began stopping by to see the colony. The students had become experts on Earth and Mars and were eager to share their knowledge.

The students, led by Mario and Megan, decided to build a life-size model of one of the living pods. They collected boxes and used many of the 5th-grade math goals to construct a Prototype Pod. Mario named the pod the Prototype Pod and explained a prototype to the other students. Students simultaneously created and displayed science experiments developed for the International Space Station and Mars in a Virtual Science Fair. The entire student body, parents, and many community members were invited to view the projects at an end-of-year event.

While still testing below grade level in reading and math on standardized assessments, Mario had made tremendous gains in two years and was continuing to gain ground. As for his science, Mario proposed that we build and launch the pods from the moon as the lower gravity of the moon would mean rockets would use less fuel to launch and have more left for a possible return trip to Earth. He was delighted when shown current articles from NASA where aerospace engineers were considering just such a proposal. This from a child who teachers thought might need a more supportive special education placement!

Megan also had grown in important ways. She no longer approached learning as an exercise in remembering and repeating information but rather as taking on challenges and seeking answers. Her self-confidence, in turn, had made her into a true leader. While her reading and math levels had continued to grow, her ability to apply knowledge appropriately reached new heights. And for the first time, she shared with us, she loved to learn.

Project-based learning freed a high-achieving student to be more creative and enabled a struggling student to flourish when they were able to apply their knowledge in practical authentic settings. For the teachers, project-based learning presented an opportunity to learn anew how to meet the different needs of different students. **K**

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