

FROM DISCOVERY TO INNOVATION TO CREATION

21st Century Learning Spaces that Ignite Students' Passion for Learning

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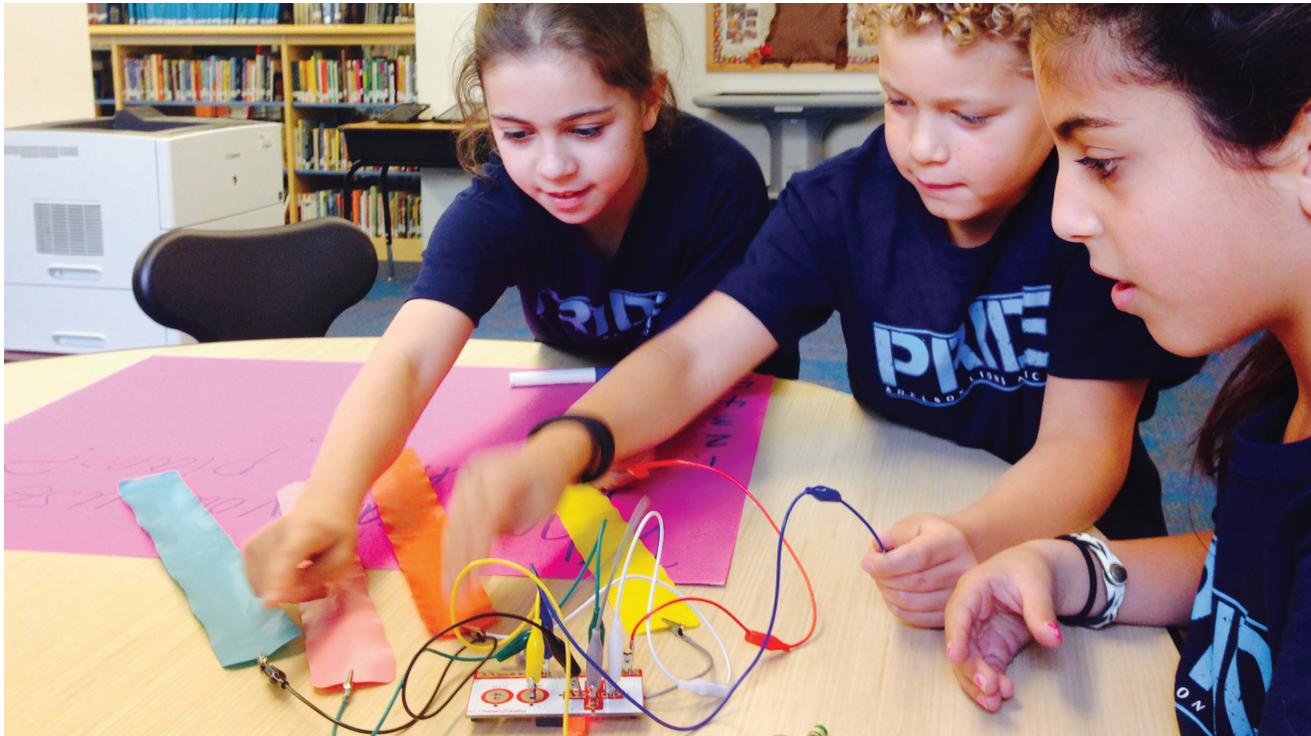
Students walk into the room, purposefully heading straight for their project, while their teacher is talking with another group of students: Teenagers who don't wait for their teacher to tell them what to do, who are self-directed, who can't wait to create, and learn enthusiastically beyond what they had imagined they could.

This is no utopia. I see it daily in the vibrant learning spaces of the Adelson Educational Campus.

Let's not call them classrooms—this word evokes a form of education from the age of Industrialization that was suitable for the mass production of basic reading and math skills among a wide range of different learners.

The knowledge base needed to succeed in today's post-Industrial age is very different. Technology continues to change rapidly, and with it, professions emerge and new skills are required to adapt to a world in which the only constant is change.





This development has spurred rethinking of what “learning” means in the 21st century: critical thinking, collaboration, creativity, and learning how to study and be self-directed have become core skills besides reading, writing, and arithmetic. Students need to become producers rather than mere consumers, ready to innovate and find creative solutions to challenging problems.

A rethinking of the physical spaces for learning new and traditional core skills is happening: MIT and Stanford are among the educational institutions spearheading the redesign of learning spaces into hubs that foster innovation.

Mitch Resnick and Eric Rosenbaum of the Massachusetts Institute of Technology emphasize that “what is needed to help young people prepare for life in today’s society” is a “playful, experimental, iterative style of engagement, in which makers are continually reassessing their goals, exploring new paths, and imagining new possibilities.” This process—they use the concept of tinkering to describe this key learning skill—leads to imagining and then creating innovations. “Designing for Tinkerability” involves developing



spaces and opportunities for re-imagining and innovating. Stanford’s d.school, an innovation incubator which is being used as a model for the redesign of many things, from consumer products to teaching and learning spaces, emphasizes the creation of flexible spaces that allow for multiple and evolving uses. Both Stanford’s d.school and MIT professors Resnick and Rosenbaum emphasize that the key to fostering innovation lies in creating a context and culture that allows for creativity, communication, and collaboration.

The Adelson Educational Campus is fostering such a culture, and over the past year, this culture has been given physical shape in three learning spaces—The Discovery Lab in the Lower School, the Innovation Lab in the Middle School and CREATE, the Computer-Electronics-Arts lab in the Upper School.

The Discovery Lab in the Lower School is an inviting open space, which encourages collaborative learning using a wide variety of tools. Computers come along with books and other traditional media, showing elementary school-age children the importance of many different types of media, and that computer technologies are an integral part of daily life. Age-appropriate robotics and electronics kits invite “tinkering” and learning through discovery. Amy Novak, Instructional Technology Integration Specialist for the Lower School, designed this space in response to detailed observations about how the lower school students were helping and encouraging each other, as well as research into innovation hubs: “I looked at top tech companies and how they designed their work spaces to allow for maximum collaboration, innovation, ingenuity and imagination.” The result is an inviting, open “collABoration” space that allows for individual, as well as small and large team discovery, creativity and problem solving.

This flexible space, promoted through Amy’s collaboration with teachers, aids many aspects of learning: “When walking through the doors, there are often many different projects in process. I work



in conjunction with classroom teachers and we devise technology-integrated projects based upon their courses of study. In any given day, there can be a group working on computer programming, a group researching famous artists who carve with natural materials, and a group conducting an experiment on leaf casts to see how water diffuses through the veins. Collaboration has become such a main focus that students are expected to work together to address any issues or problems that arise. This has allowed us to move away from the didactic teaching of word processing skills and instead implement beginning coding instruction at the early



age of 5." At its foundation, the Discovery Lab was designed to inspire students to explore how they can use technology to solve the world's problems. Before beginning any project in the Lab, there is a period of inquiry followed by collaborative brainstorming. By working through the steps of inquiry, our students learn to process information after a question has been asked. Students learn that if they can't find the answer, they can try to work it out on their own, or they can collaborate with their peers to find a solution.

We are pushing our students to imagine, to pose questions, and to find the answers through the use of technology.

Robin Pence, the Middle School Technology Integration Specialist calls the middle school's technology learning hub the "Innovation Lab"—what happens here goes beyond working with computers: "It is a way of thinking: I want our students to regard this as a space in which there are computers, yes, but also robotics,

electronic components, synthesizing tools, a space where they can take their learning to a place that they could not go to in a computer lab." Here she teaches much more than computer science: it is a maker zone, where students have the space and opportunity to create, explore, design, invent, and tinker. Here, students analyze technologies by taking them apart, and learn creatively by putting components together in new ways. In this learning space, students become wizards, creating magic with technology.

In the Upper School, the computer lab has become the CREATE space: ComputeRs Electronics ArTs. In this flexible space which houses computers, mobile devices, electronics and microcontrollers, students are excited to learn beyond what they thought they could: Two artists are learning to program in Python to create interactive animations of their gorgeous artwork. A budding musician is hacking and reprogramming Arduino microprocessors to create an electronic harp. Groups of students who have never programmed before are focused on creating their own computer games.

Yvonne Houy, Instructional Technology Integration Specialist for the Upper School, has a hard time getting the students to stop for lunch. They are hungry to explore, taking pride in what they discover and create.

Adelson Upper School students have access to resources to dream, design, code and build—with confidence.

They can ignite their passions, and connect those passions to learning. Inspired by Tobin Herringshaw, a filmmaker and member of the Upper School faculty, students have been creating their own media: videos, publications and digital art using state-of-the-art professional software. The filmmaking class takes great pride in its productions, staying after school to get the editing just right. The student yearbook staff has talented artists learning professional publication skills. Students in the digital creation elective are learning the ins and outs of Photoshop and Illustrator — one student showed her creation to students and teachers in the hallway one morning, glowing with pride. With and beyond

the CREATE space, the Upper School is integrating cutting-edge technologies throughout the curriculum to create a dynamic learning community that fosters innovation by promoting critical thinking and creative problem solving.



The innovative learning hubs of the Adelson Educational Campus encourage a way of thinking about the world that students can use to succeed in and beyond the classroom. Here students can reimagine themselves not as passive information receptacles, but as active shapers of knowledge. They gain confidence in their ability to create and innovate as they

progress from lower to middle to upper school.

Brad Mishlove, founder and CEO of Catapult Groups and a parent in our Upper School, shares that our most successful business leaders possess tenacity, broad-based knowledge, flexibility, and the ability to work within a team. “Successful leaders have vision and a strong ability to communicate that vision. It is clear that things are rapidly moving and that a leader has to be able to adapt to change. Beginning those important skills and practicing them at a young age will give Adelson students a leg up,” Mishlove reported.

Amy Novak cites JK Rowling as a source of inspiration, who, as other visionaries before her, captured her ingenuity on an old-school device, a napkin: “Imagination is not only the uniquely human capacity to envision that which is not, and, therefore, the foundation of all invention and innovation. In its arguably most transformative and revelatory capacity, it is the power that enables us to empathize with humans whose experiences we have never shared.” We are empowering our students to explore, innovate and create, but most significantly, to connect.

