



# Driving Value in Tech-Rich spaces

*Advances in information  
technology enhance,  
diversify today's learning  
environments*

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**B**uilding technologies have shaped the environments in which we live, play, work, and learn, and information technology (IT) continues to affect our relationships within these spaces. More specifically, IT is changing the educational landscape by influencing policy regarding how teaching and learning take place.

IT augments the learning process because it grants students immediate access to information, anytime and anywhere. This technology can be used to engage students directly to take risks, work independently and collaboratively, and develop problem-solving skills. It also personalizes the learning experience so that each student is continually evaluated as he or she works through specific tasks, leading to a positive and empowering learning experience. According to research by the Projects for Environmental Health Knowledge and Action (PEHKA), technology grounds students within a space, fully engaging them in specific tasks. As a result, students develop creative, critical thinking, and communication skills, making IT a potential conduit for engaging the entire learning community.

#### **INTEGRATED LEARNING ENVIRONMENTS**

To sustain these engagements and optimize the learning experience, technology tools must be practical and thoughtfully integrated within the design of the space. The social environment—students, teachers, staff, and community members—is shaping





**Design of the Marine Science Magnet High School, Groton, CT, designed by JCI Architecture, supports the different ways students work and solve problems.**



**Planning of Stormanston High School, Perth, Australia, designed by EIW Architects, was similar to that of early learning centers to accommodate a variety of learning styles.**

and being shaped by the physical environment. Simultaneously, the physical environment—spatial design along with IT—is influencing and being influenced by the social environment, making it a vehicle for change that encourages students to explore the world in which they live. These explorations encourage the student to master skills as he or she develops meaning and personal identity while working independently and with others on the tasks at hand.

The spatial design of the learning environment should include activity settings that allow students to interact with their peers and teachers and explore with low levels of adult guidance, as noted in Roland Tharp and Ronald Gallimore's book *Rousing Minds to Life: Teaching, Learning, and Schooling in Social Context*. These activity settings are defined learning zones and can be a grand staircase, soft seating areas, or booths with built-in tables and chairs within interstitial spaces between classrooms, to name a few. In these settings, students discover how to maneuver the spaces themselves as well as how to negotiate the spaces with others, according to PEHKA.

### LINKING TECHNOLOGY WITH SPATIAL DESIGN

By viewing the student and the learning environment as active, the spatial design must be planned to provide activity settings where students are comfortable, can stay on task, and can choose to work cooperatively or work independently.

Instead of being restrictive, classrooms should be re-examined as flexible, fluid, and flowing spaces where opportunities abound and students come together and work through intellectual endeavors. They also should be adaptable, layered with a variety of activity settings that encourage individual/independent learning, one-on-one learning, and small and large group meetings. This design approach reflects the planning of early childhood and kindergarten spaces, where a variety of settings are created that expand and contract as needed to support the evolution of the task at hand—depicted in the rendering above, right-hand side.

### CREATING SUSTAINABLE SPACES

In order to support a sustainable environment, IT must be well suited to the anticipated learning activities before it is implemented. In this re-imagined layered classroom, a combination of IT might be used, including both wired and wireless systems. The space should be equipped with features that support the dif-

ferent ways that individuals and groups acquire knowledge, as well as the teaching pedagogy, such as:

- Fixed tables with chairs and high countertops with stools where laptops, tablets, or handheld devices are used to support independent learning and one-on-one work.
- Fixed or unfixed soft seating around fixed tables with LCD screens support small social groupings of four or five students.
- Fixed round tables with docking ports for laptop computers support social groupings of six to eight students spaced approximately 5 feet apart.
- Semi-fixed rectangular tables (two) or D-shaped tables with integrated digital screens provide flexibility and mobility for groups of four to six.

The D-shaped table is a flattened hyperbolic shape that offers a balance between round table discussions with improved viewing positions in relation to the shared screen. A gap between the screen and the table allows an individual to stand at the screen and use the touch overlay.

- Podiums may be located in these spaces, but must support personal interactions and not become physical barriers between students and facilitators, according to PEHKA. Their location in the space must be temporary and adaptable.

No matter the design approach, learning environments must be provided with additional focal points to receive and display work. At minimum, each work area should include vertical writing surfaces, which help keep educators from depending too heavily on the technology in the event the technology fails. They also move the student from an isolated learning environment to a collaborative one where they can develop ideas in relationship with others and see that those ideas are valued.

### LEARNING BEYOND THE CLASSROOM

Spaces that flow do not necessarily have to be void of walls. Regrettably, the design community has embraced this notion as a solution for creating flowing, fluid, and flexible spaces, rather than understanding that all spaces need to be programmed and understood in order to be optimized. To enhance learning opportunities beyond classrooms/learning studios, spaces must be programmed and planned to encourage students to stay on task wherever they are and also must accommodate the different ways individuals acquire knowledge, according to PEHKA.





This breakout room at Holy Cross College, Western Australia, designed by EIW Architects, serves as private and enclosed activity space.

PHOTO COURTESY OF NEIL GRIME



PHOTO COURTESY OF PETER JAMIESON

Integrated, tech-rich collaborative spaces designed by Architectus and Professor Peter Jamieson shine at the University of Melbourne.

Look into incorporating these features:

- **Breakout niches:** These are less private and more open areas, such as recesses and alcoves, that offer more independent learning activities on laptops and other handheld devices.
- **Breakout hollows:** These are more private and semi-enclosed settings for one to three people, such as openings in walls along the corridors outside classrooms within the instructional spaces in public areas.
- **Breakout rooms:** These are private, enclosed activity settings for one to six people that are intended for staff, parent, and/or student meetings and may be equipped with moveable or fixed furniture. Wireless and hard-wired technologies, along with projectors with pull-down screens and/or LCD screens, may be considered for these spaces.
- **Breakout nodes:** These spaces encourage a range of organized and spontaneous interchanges and allow independent, one-on-one, and small and large group transactions to occur simultaneously. They should be outfitted with wired and wireless technologies to accommodate individual and instructional uses.



PHOTO COURTESY OF PAUL WARGHOL

Breakout hollows at the Gateway School of New York, designed by Andrew Bartle Architects, provide students with flexibility and independence.



PHOTO COURTESY OF AL PAYNE PHOTOGRAPHIC

This breakout space at Phoenix Union Bioscience High School, Phoenix, AZ, designed by Orcutt | Winslow, accommodates gatherings of all sizes.

In order for these settings to provide learning opportunities regardless of respective financial situations, they must take on other dimensions that are not technology driven. The learning environment must be understood as forever evolving and as a vehicle that carries and reinforces the values, mission, and vision of the learning environment. The building itself should assist in the learning process, and the things to be learned should allow the development of a culture of place. While IT can assist in this process, it should not be seen as its defining component.

As we consider design of the learning environment for the next decade and beyond, we must begin by providing students with a sense of place. To inspire future learning spaces, reflect on the students of today—where they learn most effectively, how they prefer to learn, what tools they need to acquire knowledge—and explore a balanced approach to learning that includes time for creativity and development. ■

## SPACES THAT STIMULATE

Learning environments must be stimulating, flexible spaces that offer a variety of settings with which students can actively engage and which they can shape in accordance with their learning needs, their abilities, and what they need to learn. Technology-rich learning environments may contribute to the quality of the spaces; however, they require a substantial financial investment associated with the use of information technology—for example, the initial purchase, ongoing maintenance of hardware and digital curricula, and professional development of staff, etc.

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