

Leveraging Digital Depth for Responsive Learning Environments: Future Prospects for Wearables, Augmented Reality, and Virtual Reality

Digital depth is the layering and integration of data, computing, and connectivity onto physical environments. Wearables, augmented reality, and virtual reality create varying degrees of digital depth, supporting the creation of learning experiences characterized by immersion, embodiment, contextualization, and self-awareness.

ENHANCED PHYSICAL SPACES Wearables

Wearables enhance personal awareness and performance through dynamic feedback, and assisting individuals in cultivating deeper levels of self-knowledge, enabling greater agency and self-improvement.

HYBRID SPACES Augmented Reality

Augmented reality enhances the physical world through its capacity to create dynamic visualizations of concepts, data, and artifacts, helping to deepen understanding and experience through rich visualization.

FULLY DIGITAL SPACES Virtual Reality

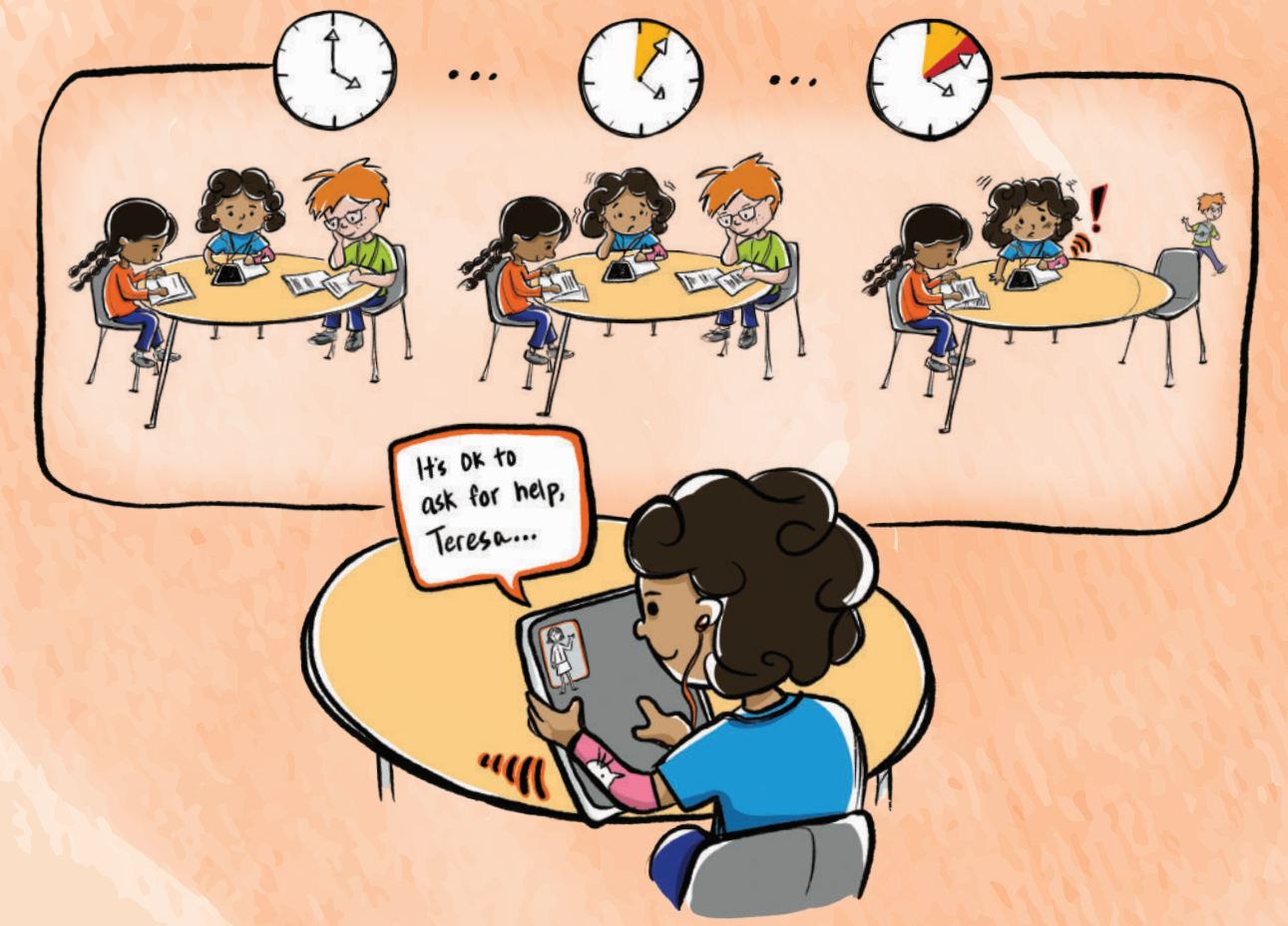
Virtual reality shifts perspective and identity through immersive embodiment and allows for world building and experimentation through digitally created worlds, environments, objects, artifacts, and characters.

The future vignettes below illustrate possibilities for how educators and other stakeholders might take advantage of wearables, augmented reality, and virtual reality to support the creation of responsive learning environments.

MentorConnect: Responsive Assistance for Learners

A fourth-grade student uses information from a wearable device to help surface difficulty approaching a homework assignment. A linked app reminds her that she can ask for help. It also connects her with the relevant educator if she needs support.

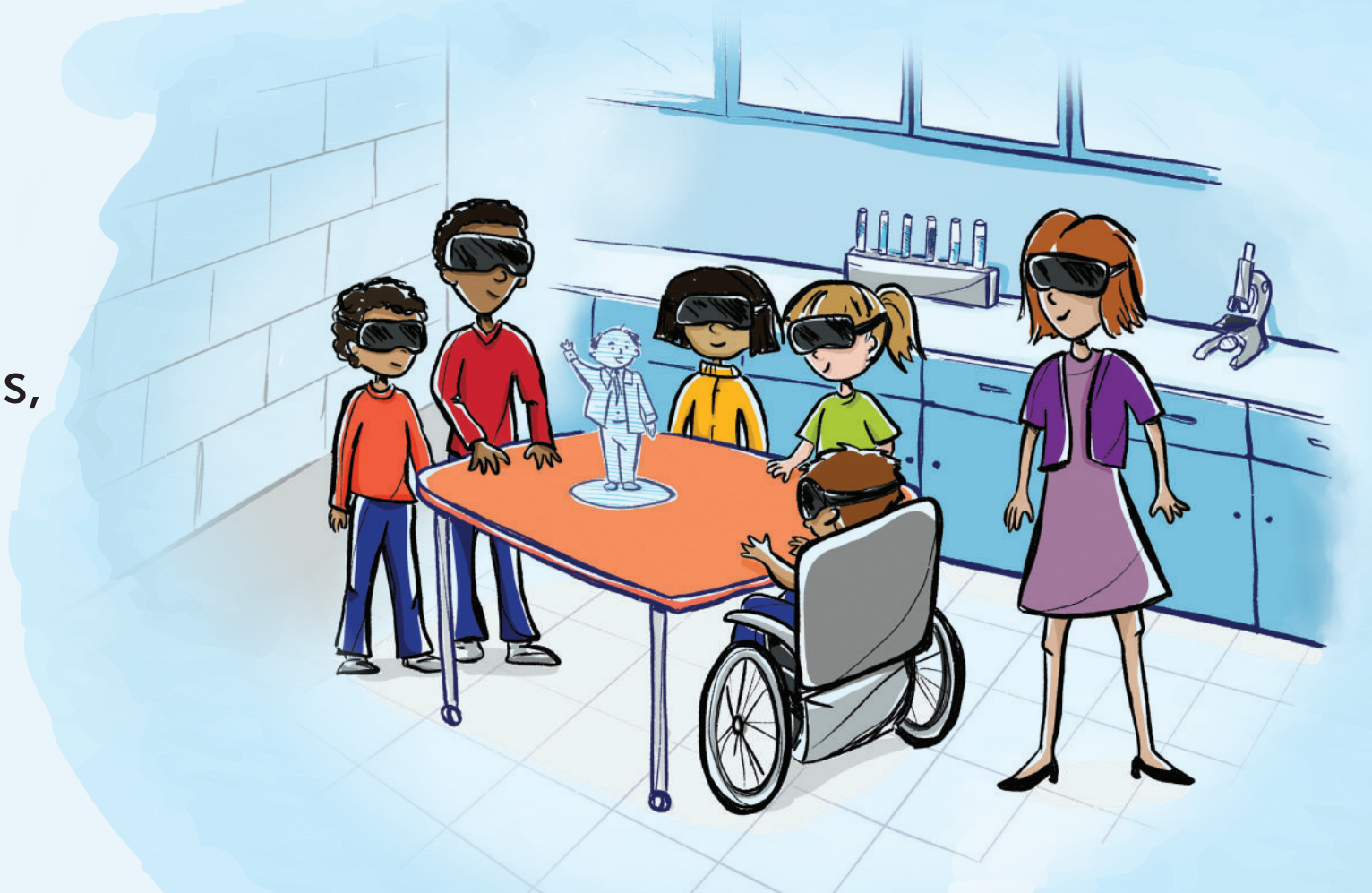
- What if wearables and augmented reality could help learners navigate extended learning opportunities by connecting them with mentors and coaches wherever and whenever they were needed?
- How might wearables, augmented reality, and virtual reality expand and diversify educator roles or bring new kinds of expertise to learners?



Learning Matrix: Digital Build Out Closes Resource Gaps

Using digital tools, educators have turned unproductive or abandoned buildings such as old warehouses, shopping centers, and public buildings into venues for compelling, high-quality learning experiences. In so doing, they are helping learners access resources, learning experiences, and specialist teachers that are often not available in poor or rural schools and districts.

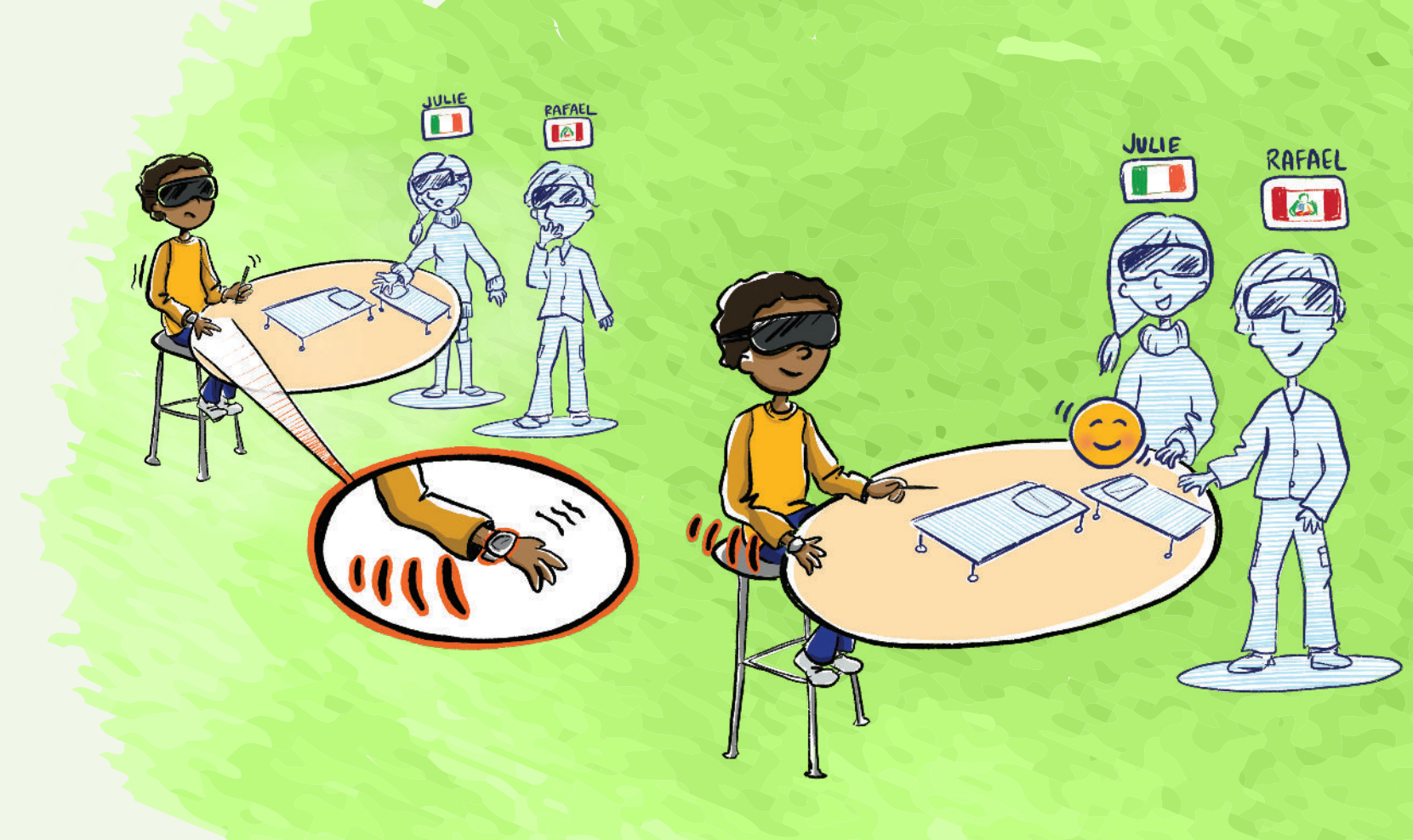
- What if educators could help address resource gaps by using augmented and virtual reality to apply a digital layer atop unused community spaces?
- How might these technologies help create new types of learning spaces or breathe new life into existing urban and educational infrastructure?



Holistic Assessment: Authentic Performance, Evaluation, and Reflection Support Deep Learning

An assessment tool powered by augmented reality, virtual reality, and wearables is providing a way for students to immerse themselves in realistic future learning and work settings while honing their collaborative and creative practices and reflecting on their performance with trusted, knowledgeable professionals.

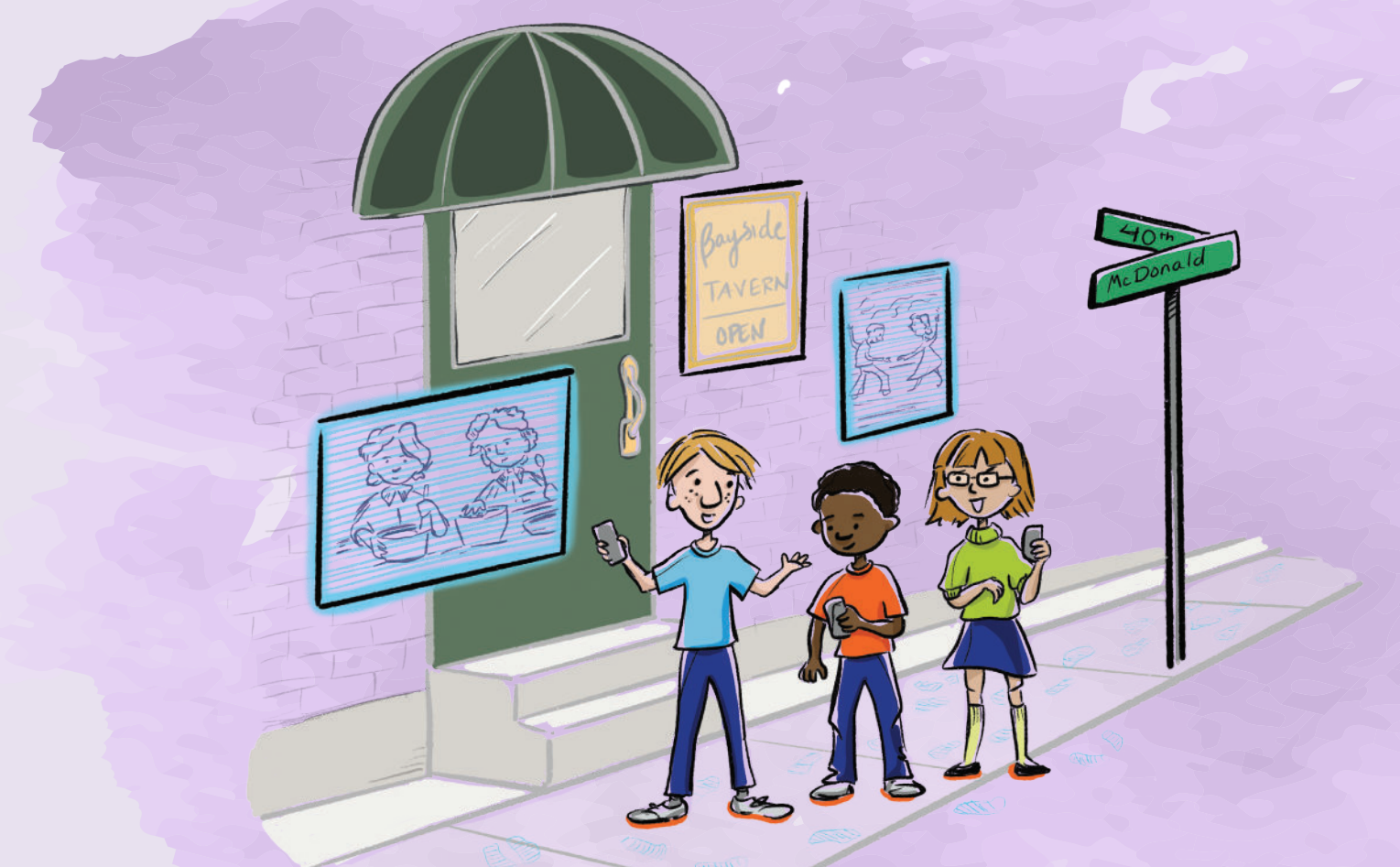
- What if students could practice key social-emotional, cognitive, and metacognitive skills in safe virtual environments, aided by digital depth technologies?
- How might virtual environments be used to help develop learner agency?



Digital Graffiti History: Students Explore Their Community and Local Heroes

Students become local historians and storytellers through the use of augmented reality to create digital graffiti consisting of three-dimensional overlays of text, images, and video, turning their neighborhood into a living history book.

- What if augmented reality supported students in overlaying their perspectives on social justice issues atop their own neighborhoods?
- How might the authoring and tagging capabilities of augmented reality tools help students create interactive exhibits and other artifacts that demonstrate their learning?



Changing Bodies, Minds, and Policies: Deep Empathy through Embodying the Other

Education policy makers and administrators “walk in the shoes of others” through immersive narratives provided by virtual reality and other digital technologies to foster empathy and perspective-taking in order to help craft policy.

- What if digital depth technologies could create immersive narratives enabling education decision makers to experience the lives of others, increasing empathy for the students and families whom their decisions affect?
- How might experiences that enable immersion and embodiment support the development of perspective-taking, empathy, and social-emotional skills among other stakeholder groups?

