Re-Imagining Education and Training: A Potential Future

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A Potential Future Learning Experience

Sometime in the fairly-near future…
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Suppose I'm a university student.

I’m sitting in my dorm room or bedroom at home, exploring Ancient Greece using a future, holographic form of Virtual Reality.
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A “coach” – part of the program – observes me and guides me via an earpiece, telling me stories and asking me thoughtful questions.

Even better, it answers my questions, which I can ask via speech or, if I prefer, text. It even observes my gestures and can react to them.
Since I’m “in” ancient Greece, I can also talk live with fellow students who are joining me on this virtual trip, and can see them via a small headset.

The “AI” coach can follow along. I/we can ask the coach to “leave” if we want to be unmonitored.
A Potential Future Learning Experience

That summer, I take a trip to Greece, and have my intelligent guide right there with me—aware of where I am and what I learned, talking with me (if I want) as I see the major ancient sites.
A Potential Future Learning Experience

But back to today: since I want to make a little extra money, I’m working in a clothing store which we’ll assume looks like today’s stores.
A Potential Future Learning Experience

There, my job is to help customers find what they need. I did need some training on service and sales skills—more in a bit on that—but I also have a coach watching, listening, guiding, speaking in my ear to assist me.
A Potential Future Learning Experience

Here’s how I learned to work with customers when I started working at my retail job:

• Some training—a holographic simulation in which I interacted with realistic, programmed characters.
• A coach to help me
• The system sensed my tone, emotion, and anger when I interacted. Even if I said the right words, the system and coach could provide me with feedback on more visceral reactions.

This was set up as a “serious game” in which I needed to make customers happy and make sales.
I also have a just-in-time app at work that knows me and my job and questions and helps me, tells me who else to talk with, too.

This lives on my modern phone—a small earpiece and screen, or perhaps special glasses—so I do participate in the real world, minimally-augmented.
Back in the university world, a similar program serves as my academic AI advisor assistant, helping me decide which areas of study to pursue, what activities to take part in, etc., so I can follow my dreams and grow both socially and intellectually.

Academic programs are much more granular--I may take some longer “classes,” but many shorter, focused ones as well.

My AI advisor program makes heavy use of data—about me and my interests and about the courses/activities—to help guide me.
Summary of My Experience

Key elements of my experience:

- Virtual Reality environment.
- An artificially intelligent coach.
- The coach can (at least with my permission) monitor my behavior and even (via sensors) my emotions.
- Collaboration with other (real) people.
- Augmented Reality.
- Just-in-time assistance (at my own initiative and via a coach).
- Personalization.
- Game-like feel to some activities.
Compelling Experiences: The Role of Technology
The Role of Technology in Learning

Making the best use of technology:

• Re-envision learning and learning experiences.

• Lean on the past, but don’t just mimic the recent past with better/fancier technology.

• Use research and practical experience to inform a creative process.

• My “potential experience” is just part of one vision, and intended to provide some suggestions. I’m sure it’s too limited in many ways!
The Role of Technology in Learning

Making the best use of technology:

• Focus on experiences that suit the audience rather than solely on content.

• Imagine and create experiences—and new technology—that the target audience connects with emotionally.

• This approach involves both art & science!
A Little Bit of Learning Theory
“...knowledge is situated, being in part a product of the activity, context, and culture in which it is developed and used.”

John Seeley Brown, Allan Collins, Paul Duguid – 1989

“...are most simply defined as the ordinary practices of the culture.”

(Brown, Collins, & Duguid)
Research in cognitive science tells us that knowledge is not separate from doing.

Therefore, effective teaching and learning methods incorporate context and actions on the part of the learner. “Authentic” activities are ideal.
The apprenticeship model dates back at least to craftsmen in ancient Babylon under the Code of Hammurabi in the 18th Century B.C.

(Encyclopedia Brittanica)
Advantages of the Apprenticeship Model

• This was a learning-by-doing approach: people would learn by practicing.

• There was a coach—an experienced mentor.

• Apprenticeships weren’t just a one-time event; the apprentice often continued to work with, and consult with, the master.
Why Don’t We See More Apprenticeships Today?

- Apprenticeships are expensive! Lots of time of the “master” is needed.

- It doesn’t scale up: “masters” may be in short supply, especially for a one-on-one model—we can’t create enough new workers with only this model, so the lecture/test classroom method took over.

- Traditional apprenticeships also don’t serve a geographically-disparate audience.

But we can use technology to create all sorts of exciting, effective experiences that do scale up in all ways!
A High-Level View
We need to design learning experiences such as the following:

- Environments that allow experimentation and help people grow and develop.
- Enjoyable, personalized experiences that may well look entirely different from today’s concepts of education and training.
We haven't done this consistently because of scaling:

We'd need too many fantastic teachers and small class sizes that accommodated the best learning methods.
New technology, particularly AI and AI techniques—allow us to create learning environments and experiences unlike anything we've seen before, and that work on a large scale.
Using AI to Create New Learning Experiences
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• Smart learn-by-doing environments (video, holograms, VR, more) with realistically-behaving characters, objects, etc.

• These can include speech, expressions, emotions, and more.
Using AI to Create New Learning Experiences

- Interactive approaches to augmented reality (a la my imaginary trip to Greece).
Using AI to Create New Learning Experiences

- Intelligent coaching, feedback, and guidance, potentially including discussions, Socratic dialogs, etc., with a coach/mentor.
Using AI to Create New Learning Experiences

- Just-in-time information that is aware of the learner’s context and physical location.
Using AI to Create New Learning Experiences

• Personalization and adaptivity are underlying concepts throughout the components I have described.
Where Do We Go From Here?

• Look to create technology that allows us to build new learner experiences.

• Experiment with new ideas in context, not just as technology on its own.
Where Do We Go From Here?

To me, our goal is to reimagine education, training, and performance via creative and research-based uses of technology.

Design is an both an art and a science.
“…technology alone is not enough. It’s technology married with liberal arts, married with the humanities that yields us the result that makes our hearts sing.”

--Steve Jobs
Thank You!
I’m happy to discuss any questions and comments!

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