Augmented Reality and Alternative Reality Games in Learning

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Q:What are the most exciting innovations you see happening right now in learning technology? What opportunities do these innovations present?

A: I'm excited most about Augmented Reality (AR); I think it's been underused. There are still barriers such as platform-independence, context recognition, and cost–but it's getting better. I particularly am intrigued by Alternate Reality Games (ARGs) as a learning mechanism (which properly is called augmented virtuality). Annotating the world seems like a really intriguing opportunity, which seems to have gotten lost in the excitement over generative AI and VR. While both have interesting potential, they are currently overly-hyped from 'shiny-object' syndrome. For ARGs, layering objectives on top of the world, having the world react and respond but under artificial control, brings learning closer to the actual performance.

Q: How might the wide array of emerging artificial intelligence tools potentially lead learning designers away from best practices and cognitive science?

A: If people aren't aware of the weaknesses of the new artificial intelligence (AI) tools, particularly the fact that they really don't understand anything, people can overly trust them. They're just trained to be good predictors of what to say unfortunately on a database that's flawed. Thus, they need people in the loop; they're good partners for thinking, but they're not a replacement. Of course, that's not what cost pressures will lead people to want to believe. They also are focused on knowledge, and don't understand application to performance either, so they'll likely be overly focused on information dump and knowledge test, not meaningful practice. This isn't even mentioning the other issues: computational process effects on the environment, and copyright issues.

Q: What emerging technologies or capabilities do you think will be most transformative for learning in the next 3-5 years? How so?

A: I truly think that what will be most transformative isn't tech, but instead a focus on the cognitive and learning sciences. Shiny technology on top of bad design is still bad design! When we get the science right, we will find we can a) then layer on tech appropriately, and b) actually have a meaningful impact. Truly understanding how we think, work, and learn is going to make a much bigger difference than any technology without that knowledge.

Q: What role does learning science research have to play in the ongoing development of learning technology? What are the most impactful ways research can inform innovation in your view?

A: Besides knowing what we need to do before choosing how to do it, the other major way we'll make progress is truly understanding the cognitive affordances (utility or capability) of technology. We need to answer deep questions about when technology makes sense. When do the costly and complicated factors surrounding virtual reality really suggest that the cost-benefits are worth it? How do we use AI in ways that empower us, not lead us to ever-more costly mistakes and dehumanize the workforce? These are fundamental questions that can only be answered by understanding the impact on how we perform.

Q: What do you see as the most exciting frontiers in applying cognitive science understanding to create better, more intuitive learning tech experiences? Where is the greatest potential?

A: I strongly believe that understanding the 'emotional' side of the equation is the big opportunity. With the caveat that I use the word 'emotion' as a placeholder for ideas that aren't truly emotion but also aren't cognitive, they're really conative (intentional). We have evidence, for instance, that motivation in learning matters. Similarly, anxiety can interfere and psychological safety facilitates learning. How do we do this reliably and repeatably? That's something I've been interested in since my first job out of college designing educational computer games, and led to my first and most recent books. In the my most recent book, I step away from games and think more broadly about how we initially 'hook' learners into the experience, and then maintain that interest through the experience. We really can make learning 'hard fun', and when we do it becomes transformative. We have pretty good guidance on the learning science (though we are lax in applying it), but we need to be better informed on the engagement side.

Q: What mistakes do you commonly see organizations make in pursuing learning technology innovation? How can they get it right?

A: As suggested above, shiny object syndrome is a major problem. Too often, people chase technology to be seen to be using it. Instead, they should be crafting small experiments and learning from them. Once they've understood the tradeoffs, then they can make informed decisions about how to properly deploy technology in cost-effective and impactful ways. Failure is a powerful opportunity for

learning that we underestimate in fear of making mistakes. We need to become learning organizations where making mistakes is understood as part of the process of adapting and improving.

Q: As a veteran in this field, what key trends or developments do you foresee that could significantly impact the way organizations approach learning technology strategy, and how should they prepare for these trends?

A: The one thing I think we miss, to our detriment, is what we can do about context. We're pretty good these days about knowing where people are and using that (c.f. geofencing, GPS), but we don't do enough about 'when' people are. We could be instrumenting calendars and reminders much better to be providing contextual help for the task you're engaged in (regardless of location). We could, further, be doing even more to supporting people in the moment, and most importantly, developing them over time. We do too little to extend learning beyond the 'event' and we now have the ability. It's a different AI, semantic not sub-symbolic, but it's almost untapped in utility. We also can be much better about tracking activity, and using that information to make better decisions.

Q: In what ways might emerging technology help balance the understanding of cognitive science with the practical application of technology to develop solutions that effectively address diverse learning needs (including neurodiverse) within an organization?

A: Cognitive science tells us that we learn well from good models and good examples as well as practice. We need those small experiments, but we also need good case studies, and those models. People don't pay enough attention to models, and are reluctant to share case studies. Vendors like to do the latter, but clients are frequently averse to sharing data, and all too frequently don't really collect it (an industry failing). We see much hype without truly good design, we don't pay enough attention to the underlying models, and we tend to do big showy projects which aren't based on a solid foundation. We would benefit from being more reflective on what matters.

Q: Could you share any success stories or breakthrough innovations that demonstrate the effective alignment of cognitive science principles, technology capabilities, and strategic vision in enhancing organizational learning and performance, and how others might learn from these examples?

A: There aren't enough examples, but I'll mention a few. One was the game I led development on for the Australian Children's Welfare Agency, Quest for

Independence. It was developed to help kids who grow up without parents (foster care, etc) learn to survive on their own after turning 18 and being pushed out. It successfully situated, I'll suggest, meaningful practice in a plausible setting. Another example is Lifesaver, an app that teaches CPR. In four compelling video scenarios, you have to practice the skills, including moving your device at the appropriate speed and range of movement to administer CPR chest compressions. It's a bit of an ARG, really. There was also a virtual world endeavor from American Family Insurance that had you evaluate damage for adjusting purposes, then you could literally take off the walls to see if your assessment was correct, designed to be supported by a mentor: virtual and social. In all cases, technology is applied in synch with cognitive science principles, yielding real outcomes.I wish there was more, and the examples were as forward-looking as we'd like. I'm advising a startup, Elevator 9, that's a tool for extending learning. It's not new, but the time is right and they are paying attention to learning science. I'm serving as Chief Learning Strategist for Upside Learning, that likewise is working to integrate learning science more deeply into their elearning offerings. I'm also serving as Co-Director of the Learning Development Accelerator, a society for evidence-based L&D, educating folks on the underlying cognitive and learning sciences, and the implications. This is all on top of my client work as Quinnovation! In all these roles, cognitive science is at the forefront of design, but it also takes effort on the part of clients. Educating organizations in their application of technology and the cognitive and learning sciences is the long-term need and goal.