Theaters Without Audiences:
The Changing Face of Educational Narratives

David D. Thornburg, PhD
Thornburg Center for Space Exploration
dthornburg@aol.com
www.tcse-k12.org

The day was hot, the line was long, the anticipation was palpable. Several hundred people, many with children in tow, were lined up to experience a new "ride," *Mission:SPACE* at Disney's EPCOT Center near Orlando, Florida.

Outside the Mission:SPACE exhibit at EPCOT Center

I joined the line with some friends who were eager to see what this (then) new exhibit was all about. As the line snaked its way through the entryway, we felt as if we were entering a spaceport waiting to board our spacecraft. Once it was our turn, the three of us were seated in a small capsule and strapped firmly in place. We had a viewport through which we could see the "outside," and we each had controllers we needed to use to fly and, hopefully, land the craft safely. Our bodies seemed to pitch back as we looked straight up to the sky, and at launch, we felt the pressure of takeoff as the adventure began. By the time we prepared to land, we had mastered our "controls," and almost landed safely (we overshot the landing strip and almost fell off a cliff, but were pulled back to safety).

This "ride" didn't actually go anywhere. It was a truly immersive experience that simulated a real ride just the same way a flight simulator simulates flights for novice pilots. Disney has a long track record for building these kinds of immersive experiences, and they are very popular. In fact, I wanted to go do it again.

Imagine how powerful it would be to have many educational experiences this immersive! The results would be amazing. Unfortunately, the Disney products are designed around a single simulation, limiting the curricular areas it can address, and the number of people inside the craft is quite small. Plus, these simulators are well beyond school budgets.

This does not mean that such environments should be dismissed out of hand. In a separate article, I describe the rationale and design of an educational "holodeck" that provides a lot of flexibility and can be built within today's school budgets[1]. This brief article is an extension of the holodeck article in which we will explore the changing nature of educational narratives, further reinforcing the capacity of affordable new technology to do new things, not just to do old things in new ways. The rationale for this transformation is not just because today's young people expect it, but because it makes solid pedagogical sense. If we had the means to have done this in the past, we should have, but, until recently, the requisite technologies were just not available at an affordable price.

While much has been made of the distinction between so-called digital natives and digital immigrants, there is no escaping the fact that many students avail themselves of learning spaces unknown to my generation. This was captured wonderfully in an interview of one of my former Xerox PARC colleagues, John Seely Brown, (quoted by Seth Kahan[2]), in which he related the following story:

> "Yesterday I heard an amazing comment from a 16 year old named Colin. Colin said: "I don't want to study Rome in high school. Hell, I build Rome every day in my on-line game." (Caesar

III[3]). And in so doing he is continually building a new narrative space that goes on evolving. Of course, we could dismiss this narrative construction as not really being a meaningful learning experience but a bit later he and his dad were engaged in a discussion about the meaningfulness of class distinctions – lower, middle, etc. – and his dad stopped and asked him what class actually means to him. Colin responded: "Well, it's how close you are to the Senate." "Where did you learn that, Colin?" he said, "The closer you are physically to the Senate building, the plazas, the gardens, or the Triumphal Arch raises the desirability of the land, makes you upper class and produces plebians. It's based on simple rules of location to physical objects in the games (Caesar III)". Then, he added, "I know that in the real world the answer is more likely how close you are to the senators, themselves – that defines class. But it's kinda the same."

Now Colin was quite articulate in his descriptions – perhaps more so than many of his colleagues, but his experience is replicated by other students who dismiss traditional instructional models as "boring." Some ask whether our new technologies have created new expectations, or if schooling has always been painful for many students. I think that historical studies of school completion rates prove the point that the flaw was in the original instructional model, and that the provision of new opportunities has only helped provide us with alternatives that may allow us to achieve the goal of reaching every learner.

Henry Jenkins has spent years exploring the nuances of youth culture wrapped around the rapid acceptance (and reliance on) modern technologies. A sense of how pervasive these technologies have become can be seen in a recent report from the Pew Research Center who studied text messaging by US teens[4]. This study found that 75% of all US teens have their own cell phones and that texting has become the dominant activity using these phones. One in three teens sends over 100 text messages per day.

Henry Jenkins[5] has worked with teens and concluded that they are engaged in a "participatory culture." even though these participations are largely mediated through technologies, his focus is on the culture itself, not the technologies that make it accessible. He defines participatory culture as having the following characteristics:

A participatory culture has –

- Relatively low barriers to artistic expression and civic engagement
- Strong support for creating and sharing one's creations with others
- Some type of informal mentorship whereby what is known by the most experienced is passed along to novices
- Members believe that their contributions matter
- Members feel some degree of social connection with one another (at the least they care what other people think about what they have created).

These characteristics have special skills associated with them. As Jenkins says:

> The new skills include:
> - Play — the capacity to experiment with one's surroundings as a form of problem-solving
> - Performance — the ability to adopt alternative identities for the purpose of improvisation and discovery
> - Simulation — the ability to interpret and construct dynamic models of real-world processes
> - Appropriation — the ability to meaningfully sample and remix media content
> - Multitasking — the ability to scan one's environment and shift focus as needed to salient details.
> - Distributed Cognition — the ability to interact meaningfully with tools that expand mental capacities
> - Collective Intelligence — the ability to pool knowledge and compare notes with others toward a common goal
> - Judgment — the ability to evaluate the reliability and credibility of different information sources
> - Transmedia Navigation — the ability to follow the flow of stories and information across multiple modalities
> - Networking — the ability to search for, synthesize, and disseminate information
> - Negotiation — the ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms.
>
> Fostering such social skills and cultural competencies requires a more systemic approach to media education...

Note that play occupies a central role as a skill students need to fully engage in the participatory culture. As he says,

> When individuals play games, a fair amount of what they end up doing is not especially fun at the moment. It can be a grind, not unlike homework. The efforts allows the person to master skills, collect materials, or put things in their proper place in anticipation of a payoff down the line. The key is that this activity is deeply motivated. The individual is willing to go through the grind because there is a goal or purpose that matters to the person. When that happens, individuals are engaged, whether that be the engagement in professional lives or the learning process or the engagement that some find through playing games. For the current generation, games may represent the best way of tapping that sense of engagement with learning.
> …
> Some have expressed skepticism that schools should or could teach young people how to play. This resistance reflects the confusion between play as a source of fun and play as a form of engagement. Play in the context argued here is a mode of active engagement, one that encourages experimentation and risk-taking, one that views the process of solving a problem as important as finding the answer, one that offers clearly defined goals and roles that

> encourage strong identifications and emotional investments. This form of play is closely related to two other important skills, simulation and performance.

Another researcher who has studied the role of play and engagement is Professor M. Csikszentmihalyi[6] who wrote a paper on this topic in the 1970's. But, as Jenkins says, not all games are the same:

> Teachers in a range of subjects can deploy what Shaffer[7] calls "epistemic games." In an epistemic game, the game world is designed to simulate the social context of a profession (say, urban planning), and by working through realistic but simulated problems, players learn the ways of acting, interacting, and interpreting that are necessary for participating in the professional community. In effect, rather than memorizing facts or formulas, through performances of being an urban planner, lawyer, doctor, engineer, carpenter, historian, teacher, or physicist the player learns the particular ways of thinking of these professions.

Shaffer and his colleagues[8] define epistemic games as having five aspects or properties:

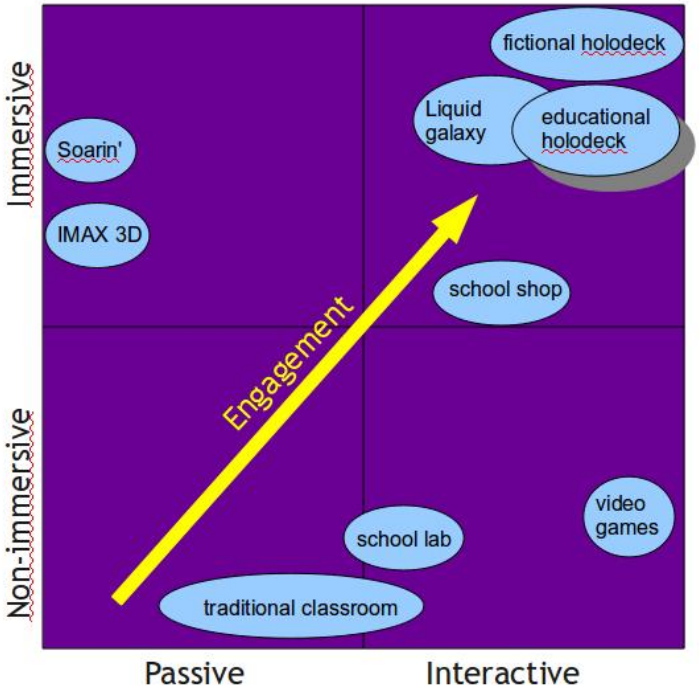
> Our project is grounded in the epistemic frame hypothesis, which suggests that any community of practice has a culture and that culture has a grammar: a structure composed of skills (the things that members of the community do); knowledge (the understandings that members of the community share); values (the beliefs that members of the community hold); identity (the way that members of the community see themselves); and epistemology (the warrants that justify actions or claims as legitimate within the community). This collection of skills, knowledge, values, identity, and epistemology forms the epistemic frame of the community. Put in more concrete terms, engineers act like engineers, identify themselves as engineers, are interested in engineering, and know about physics, electricity, mechanics, chemistry, and other technical fields. These skills, affiliations, habits, and understandings are made possible by looking at the world in a particular way: by thinking like an engineer. The same is true for biologists but for different ways of thinking — and for mathematicians, computer scientists, science journalists, and so on, each with a different epistemic frame.

The potential of new technologies is not always revealed when they first appear. As Janet Murray[9] says, the first films were basically made by setting a camera on a stage and the recording a play. It tool years for film to evolve as an art form of its own – to develop its own techniques, the closeup, looking from the actor's point of view, etc. The first films were called photoplays, a sign that they were still in such an early stage they could only be described through the use of a metaphor. As Marshall McLuhan[5] used to say, metaphors are dangerous in that they point to something new, but describe it using the language of the past. For example, the first automobiles were called "horseless carriages," and that is what they looked like. It took years for the "automobile" to be developed as its own entity. The horseless carriage metaphor lacked the capacity to anticipate the creation of suburbia, drive-through

banking, shopping centers, interstate highways, or any other the other things commonplace today.

And so it is with educational technology. We still use words like "multimedia" to convey the idea that our new tools allow various media types to be mixed. We have yet to move to the stage where we think of new technologies as media in their own rights – not just as a blending of those expressive tools that came from the past.

In some sense, from a learning perspective, the task is easier. We can divide various media into categories based on the relationship between the expressive form and the student. If we do this, four broad areas emerge based on whether they are passive or interactive, non-immersive or immersive.



From the standpoint of learning spaces, examples of each media type are easy to find. The main distinction between passive and interactive media relates to the nature of the interaction between the learner and the medium. Even if we assume that all of these media types are engaging (at least to some learners), they are still quite different. McLuhan[10], for example, distinguished between "hot," and "cold" media. Borrowing these terms from the lexicon of jazz, hot music envelopes you whether you are engaged with it or not. Cool jazz (think Miles Davis) requires the active participation of the listener to fully appreciate what is happening. In this sense, the listener is "interacting" with the music. Those who watch children (or

adults, for that matter) interact with technologies can observe their body positions and see when they are engaged with a technology (this being the "cool" tool), and when they are engaged with "hot" technologies. Television is an example of a "hot" technology characterized by a "lean back" body position. Web browsing though, has a different kind of engagement (cool) in which the body leans toward the screen. Lean-back and lean-in technologies abound. In a learning situation, the lean-in tools tend to provide more powerful engagement because of their high level of interactivity. Television, by contrast, is a passive medium, and those watching the tube tend to lean back and let the content sweep over them.

While the distinction between passive and interactive media is fairly easy to discern, we are now at a point where we can take advantage of media that are both interactive and immersive. This category of activities is the focus of our current work. It is important, at the outset, to know that not all immersive media are interactive (at least not in the way I am using the term.)

For example, web browsing and the bulk of computer games are interactive without being immersive. IMAX and other special exhibits (such as "*Soarin'*" at Disney's California Adventure Park) are completely immersive experiences, but do not involve the user with any interactive challenges. In other words, the participant has no control over any aspects of the exhibit – just sit tight and enjoy the show.

Immense power comes from having both interactivity and immersion. In that case the conditions exist for a willing suspension of disbelief, facilitating contextual learning through engagement in an epistemic game. For example, a holodeck-based simulation[1] of a voyage to Mars to look for alien life forms can encompass many curricular areas (physics, chemistry, technology, design, etc.) within the scope of an engaging narrative. Once the adventure starts, challenges appear (e.g., the spaceship encounters space debris that can ruin the craft). Students then need to figure out how to handle this challenge, and in the meantime, sirens are going off and emergency lights are flashing. The learning that takes place in that setting is clearly "just in time," not "just in case." On arrival to an orbit close to Mars, the students then launch a shuttle craft to pick up and return a sample of Martian soil for analysis. But, before opening the sample vial, they need to decide if that would be a safe course of action. (What if there are bacteria or viruses in the sample against which humans have no protection?) Students need to work together to craft a protocol for handling these samples before proceeding, all the while looking at a vial of red dirt they desperately want to get under their microscopes.

The greatest challenge in the use of immersive interactive learning spaces is not technological, it is pedagogical. As mentioned elsewhere[1] , lectures have little place in these kinds of

learning places. If prolonged lectures are needed, they need to be given in another setting. Short mission briefings are fine, but anything deeper than that will break the magic of the immense learning opportunity such spaces allow.

This indicates that, prior to using these environments, educators must experience them, and this is best done as part of an ongoing staff development activity. Because of the strong transdiciplinary curricular connections, educators can experience these learning spaces and see how to facilitate their use with their students.

About the author:

David D. Thornburg, PhD

David is the Founder and Director of Global Operations for the Thornburg Center for Space Exploration. He is an award-winning futurist, author and consultant whose clients range across the public and private sector throughout the planet.

He is engaged in helping a new generation of students and their teachers infuse STEM skills through the mechanism of inquiry-driven project-based learning.

His educational philosophy is based on the idea that students learn best when they are constructors of their own knowledge. He also believes that students who are taught in ways that honor their learning styles and dominant intelligences retain the native engagement with learning with which they entered school. A central theme of his work is that we must prepare students for their future, not for our past.

Please contact Dr. Thornburg if you are interested in presentations and/or workshops around the concepts described in this paper.

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