

Editor's Note: The second invited paper for 2004 comes from David Thornburg, a futurist and philosopher whose insights have guided corporations and governments for over a quarter of a century. Dr. Thornburg draws attention to the importance of storytelling to communicate concepts and culture, not only to our contemporaries, but to the next generation. His use of analogy and metaphors to clarify the role of various communication processes and environments brings us to realize that, like Dorothy in the Wizard of Oz, the answers we seek were always visible, but not necessarily understood – at least not until explained to us!

Campfires in Cyberspace: Primordial Metaphors for Learning in the 21st Century

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Introduction

Media are not interchangeable - a learner using the Web has a completely different experience from one watching television. Classroom presentations are fundamentally different from videos of the same class. As we use more and more electronic media in education, it is essential that we understand the unique nature of each expressive medium we encounter.

This article suggests that learning takes place in four spaces, only a few of which are honored in most schools. It offers new theory for educational systems based on four primordial learning spaces: campfires (information), watering holes (conversation), caves (concept), and life (context).

The theory is explored in a practical manner to show ways in which technology can bring balance back into our educational system. The utility of these four learning spaces is demonstrated in the context of the World Wide Web as an educational tool using a new framework for evaluating websites and other technologies as educational resources. The four spaces identified by Dr. Thornburg are used to create an educational system geared to the needs of learners and educators.

In the beginning...

The existence of learning communities probably predates civilization. As we embark on our great adventure into the infosphere of cyberspace, we can find guideposts in the primordial ooze of consciousness.

A key aspect of archetypal learning environments can be found in a tale I first heard from Gregory Bateson:

One day someone sat at a computer keyboard and entered the following question: "Do you suppose that computers will someday think like humans?" After processing this request for some time, the computer displayed the following response: "That reminds me of a story..."

Embedded in Bateson's tale is an important observation: One of the distinguishing features of humans is that we are storytellers. In fact, with the possible exception of certain marine mammals, we may be the only storytelling species in existence. This capacity of humans is so important that Jean Houston has referred to myth as the DNA of the human psyche.

The campfire...

For thousands of years, storytelling was a mechanism for teaching. While it was not the only mechanism, it was (and is) an important one. Through storytelling, the wisdom of elders was passed to the next generation. Good stories have always embodied a blend of the cognitive and affective domains — in fact, in story, there is no separation between the two. For example, one version of a creation story told among the indigenous peoples of the Northwest American Continent has Raven bringing light to the planet after it had been hidden away by Grandfather. He had hidden the light because he wanted to believe that his daughter was the most beautiful creature in the Universe, and could only hold that belief if he never saw her. Through trickery, Raven steals the light and, through mishap, creates the sun and the stars. This one story embodies not only the cosmological aspects of the people's belief, but also the metaphorical aspect of "being kept in the dark."

This quality of nuance and multiple interpretations is common to storytelling. It is one reason that adults and children can enjoy the same story together — each age takes from the story the elements that are appropriate. The power of storytelling is so great that even in more recent times (c. 250 BC,) we find Socrates responding to his students on occasion with the Greek equivalent of "That reminds me of a story."

There is a sacred quality to teaching as storytelling, and this activity took place in sacred places, typically around the fire. The focal point of the flame, the sounds of the night, all provide backdrop to the storyteller who shares wisdom with students who, in their turn, become storytellers to the next generation. In this manner, culture replicates itself through the DNA of myth. The often tangential nature of storytelling, its use of metaphor, its indirect attack on a topic, all combine to make storytelling an effective way to address topics that might be too confrontational to address head on. Story crafts its own helix around a topic. As Robert Frost said, "We sit in the circle and suppose, while the truth sits in the center and knows."

And so, from an archetypal perspective, the campfire represents an important aspect of the learning community. It does not stand alone, however.

The watering hole...

Just as campfires resonate deeply across space and time, watering holes have an equal status in the pantheon of learning places. Virtually every hominid on the planet has, a one time in its historical existence, needed to gather at a central source for water. During these trips to the watering hole, people shared information with their neighbors — those within their own village, as well as those from neighboring village, and travelers on their way to or from a distant village. The watering hole became a place where we learned from our peers — where we shared the news of the day. This informal setting for learning provided a different kind of learning community from that of the shaman or troubadour who regaled us from the podium of the campfire. The learning at the watering hole was less formal. It was peer teaching, a sharing of the rumors, news, gossip, dreams and discoveries that drive us forward. Each participant at the watering hole is both learner and teacher at the same time.

Just as water is necessary for survival, the informational aspect of the watering hole is essential for cultural survival. I'll have more to say about this later. For now, suffice is to say that the watering hole is alive and well in corporations where people gather around the water cooler (or, more recently, the copying machine) to continue a tradition of archetypal proportions. Executives and support personnel alike reenact on a daily basis scenes that have been played out on the plains of Africa for tens of thousands of years. Any disconnection from this informal learning community risks a disconnection from one of the things that makes us human.

The cave...

The learning community of the campfire brought us in contact with experts, and that of the watering hole brought us in contact with peers. There is one other primordial learning environment of great importance: the cave — where we came in contact with ourselves.

Through legends and artifacts we know that, throughout the planet, learners have needed, on occasion, to isolate themselves from others in order to gain special insights. Whether these periods of isolation took place in the forest, or in caves, whether they were the subject of great ritual, or just casual encounters with personal insight, the importance of having time alone with one's thoughts has been known for millennia.

The "vision quest" practiced by some indigenous peoples of the Americas represents one of the more formalized renditions of this practice. After a lengthy period of preparation, the learner is led to a cave with nothing but a blanket and is left for two days without food. During this time, through meditation, the learner may have a vision that can shape or guide him or her through the next phase of life. In addition to being a place of learning, the vision quest also becomes a rite of passage.

This rite of passage has another interpretation in modern parlance: the passage of knowledge from an externally accepted to an internally held belief. This internal "knowing" involves far more than memorization — it involves true insight. When Carl Jung was asked if he believed in God, he smiled and said, "I don't believe, I know."

We all have times in learning any subject when we need to internalize that knowledge. For Newton, it may have been under an apple tree. For Moses it was the wilderness. For us this internalization may take place during a walk in the woods, but is just as likely to take place during a quiet moment (or day, or week) in relative seclusion in a library (another sacred place), office, bedroom, kitchen or den.

Learners have long gathered around campfires, watering holes, and have isolated themselves in the seclusion of caves. They have experienced all these learning environments in balance and, if the balance is offset, learning suffered.

A modern example...

In my line of work, I spend a great amount of time attending professional conferences. These gatherings bring together experts who share their insights with large audiences over a period of two or three days. Over the course of the conference, one can see examples of all three learning metaphors in action.

For example, every December, there is a mathematics conference held at the Asilomar conference center near Monterey, California. A thousand or so schoolteachers gather for a weekend at the beautiful location on the Pacific coast to learn more about the teaching of mathematics. Numerous presenters share their insights through formal, scheduled, presentations. Exhibitors have their wares on display in a separate hall. Meals are held in a huge dining room, and lodging is on-site so people with common interests can share their ideas into the early hours of the morning.

A visitor to this conference would see, at any given time, examples of all three learning environments. Some attendees sit in conference rooms listening to experts sharing their insights. The glow of the campfire is replaced by that of the overhead projector, but the metaphor of the shaman or troubadour remains intact.

Outside these conference rooms, other participants gather at the exhibit hall, shuttle bus stops, main lodge, or other gathering places where they will be sharing ideas with each other. These interactions range from choosing an off-campus restaurant for a special dinner, to sharing new strategies for introducing calculus to children in middle school. In the absence of a clearly defined watering hole, gathering spots are chosen by convenience. As in the film, *Field of Dreams*, "if you build it, they will come." The exhibit hall, Asilomar lodge and dining hall are probably the closest this conference comes to providing metaphorical watering holes.

In addition to the two settings in which people are grouped together, the conference visitor would also see people walking by themselves along the trails through the dune: to the ocean shore. Individuals might sit for hours looking at the water, exploring the trees on the grounds, or just engaged in quiet thought. This "cave time" is facilitated by the nature of the Asilomar site. In fact, the ability of this one site to support all three of these learning environments probably accounts for its great popularity as a conference center, even if these multiple aspects of the facility are never overtly addressed.

It is interesting to note, by the way, that conference programs almost never mention anything other than the "campfire" aspects of the conference. Participants are invited to attend conferences to "hear the latest from experts in the field." While this has great merit, this aspect of a learning community represents only one third of the food for thought needed for a balanced meal for the mind.

In sharp contrast, I had the opportunity some time ago to see what happens when a conference is out of balance. A major invitational conference of educational technology in Washington, DC had brought an audience of about 600 highly regarded experts together for an intensive two days of presentations. The presentations were set up back-to-back, with no breaks until lunchtime, and then again after lunch with no breaks until dinnertime.

The presentations were (generally) excellent. For example, Arthur C. Clarke held us spellbound with his visions of the future during a live two-way remote videoconference from Sri Lanka. Even so, by lunchtime on the first day, there was a lot of grumbling from the attendees. They had been exposed to some intense campfires with no access to watering holes or caves. The conference was so tightly scheduled that several people complained of "overload." On the one hand, people were free to walk out of sessions they didn't like, but the presentations were of such high caliber (or the presenters were so well known) that most people were reluctant to walk out. Even so, by the second day, the audience had started to vote with its feet, building in breaks where none existed.

This experience brought home to me the importance of scheduling in opportunities for all three learning experiences, and showed the disaster that awaits those who neglect the need for balance.

While I've concentrated on the application of these archetypal learning models to conferences, they apply to classroom settings as well. Students have experienced the campfire of the traditional classroom setting and relied on the playground for their watering hole. Quiet time for reflection, when made available, takes place in libraries or study halls, or is deferred until the student goes home at the end of the day. The watering hole is being brought into classrooms today through the medium of cooperative learning but, tragically, school libraries (and the time to spend in them) are "at-risk" in schools where funding for such programs is in short supply.

Campfires in cyberspace...

Now that the national attention is directed toward the "informational interstates" kids of all ages are "jacking in" to the Internet, and our daily papers are filled with stories about mergers and joint ventures among high-tech information firms (e.g., the proposed acquisition of TCI by Bell

Atlantic), we have the opportunity to explore how these primordial metaphors for learning map into the telecosm. First, and make no mistake here, all three sacred learning spaces will have analogs in cyberspace. If they don't, then cyberspace will cease to exist as a domain of interaction among humans. Those using the new media will create their own analogs for these learning places, even if they are not designed into the system. In this regard, cyberspace is like any other frontier: rich in possibility, covered with brambles and weeds, but rich with fertile soil for development.

At first blush, it appears that the world of multimedia computing most closely resembles the domain of the campfire (at least as currently practiced). The market is replete with CD-ROM-based programs that turn the computer display screen into a colorful animated canvas on which ideas take shape and through which information is presented. The integration of text, sounds, color images and animated sequences provide many of the same tools for engagement known to the ancient storytellers, even if their images were conjured primarily through the mind's eye.

If it is the case that the glow of the campfire has been replaced by that of the computer monitor, we must ask if the stories being told around the modern fire are as compelling as those told around the old one. At this time, it is generous to say that the field is still sorting itself out. Many pieces of purportedly educational software created for the multimedia domain are mere transcriptions of material originally created for the medium of print. Multimedia is a new medium. Quality products will cease to exist until the authors and publishers understand this. When I look at a simple transcription into the new medium from the old, I feel that McLuhan died for our sins. It is time to atone for past transgressions and to realize that the world of interactive multimedia is completely different from anything we have worked with before.

For example, in the world of oral tradition and the printed page, stories have two aspects. They have a beginning, middle and end, and they have conflict and resolution in this Aristotelian world of storytelling, the conflict and resolution are the figure played against the ground of beginning, middle and end. We have certain expectation for such stories. They start with "Once upon a time and they end with some variation of "happily ever after." In the meantime, we are presented with a situation involving some conflict that, in general, gets resolved by the time the story ends. This model probably predates recorded history and is ubiquitous.

While new media can be used to tell stories in this fashion, the power of interactivity lets us move beyond the linear presentation of material. One possibility is to invert the Aristotelian world by creating a conflict to be resolved (the ground) and then to allow the user, through interaction with the multimedia software, to resolve the conflict through the creation of a unique story with its own beginning middle and end. This figure/ground reversal is possible because new media are not frozen in time. Unlike static words and images created by a storyteller, the learner can craft dynamic resolutions to a challenge created by a new breed of story maker.

The myth of interactivity...

It can be argued that virtually all multimedia products on the market today do provide some measure of interactivity. While this is true, the interactivity in some products is so limited that the flexibility I want for users is nonexistent. For example, many pieces of "interactive" storytelling software merely allow the user to choose the pace at which a linear story unfolds. True interactivity provides, at the minimum, the capacity to branch to different scenarios, to gather additional information, to take new twists and turns and, when very well done, to explore avenues never anticipated by the creator of the program.

Viewed in the context of the figure/ground reversal mentioned above, the weakness of many current multimedia titles can be seen. When users are just clicking buttons to progress through a

linear story told by another, multimedia becomes nothing more than high-tech page turning. On the other hand, when the user can craft a personal pathway through the content, even if the material is already in place, this freedom of true interactivity supports the creation of unique ways to resolve the conflict established at the start of the story. Interactivity of this type is rewarding at many levels. It facilitates creativity and the development of thinking skills by the participant in the journey through story space.

All of this is possible with the multimedia tools available today. The major limitation comes from the mindsets of those who craft products — otherwise well-intentioned people who, in many cases, are concerned with keeping development costs to a minimum and with getting products out the door in a hurry. The craft of multimedia design is not a linear mix of writing, image creation, sound composition, and selective placement of "button clicks" to advance to the next page. It is, instead, the storyteller's craft writ large — a new medium of expression whose ideas cannot be captured or presented in any other medium. We are experiencing the birth pains of this new craft, and it promises to be a noisy baby.

Watering holes in cyberspace...

If interactive multimedia represents at least one facet of campfires in cyberspace, then telecommunications represents a vast global watering hole. Anyone with a personal computer and modem can connect to a wide array of commercial and non-commercial services that provide access to electronic mail, real-time "chats" with other users, as well as other services I'll talk about later. These services are distributed throughout the world, and are connect to each other and to individual users through a complex web of networks, both public and private.

One of the richest and densest networks (a network of networks, actually) is the Internet, a Department of Defense informational infrastructure designed to serve as the communications backbone of the US in the event of nuclear disaster. This massive system has since been appropriated by researchers, educators and children as a vehicle through which they can connect to each other all over the world.

Almost all services allow users to send messages to each other (electronic mail) and facilitate real-time conferences with other users. This peer-to-peer dialog resembles the traditional watering hole activity with several special differences. First, rather than limiting discourse to people in a fixed geographic area, this watering hole is planetary in scope. Second, the current limitations of telecomputing restrict most interactions to text-based messages. This provides some measure of anonymity to the users of the system. A message in pure text form conveys no information about gender, age, disability, appearance — such an environment provides the opportunity to work with thoughts in themselves, devoid of other interpretations and biases that we might apply inadvertently if we engaged in face-to-face meetings.

This blessing is, unfortunately, also telecomputing's curse. When we have a peer-to-peer chat on any subject we wish, this interaction lacks the richness of face-to-face meetings. It is fine for topics of the intellect, but lousy for affairs of the heart. One cannot shake hands, smile, or hug through the medium of telecomputing — yet.

Caves in cyberspace...

Many of the same telecomputing services that provide electronic watering holes also provide vast resources of information that can be searched, extracted, added to, and commented upon by anyone with the interest to pursue it. Through the Internet, for example, anyone can log onto NASA computers to download the latest images from space, can access Library of Congress archives, university libraries, government agencies, and even some private corporations. The

Internet is so complex that navigating through it bears some similarities to listening to short-wave radio — there is some wonderful stuff out there, but it takes patience and diligence to find it.

On the private sector side, one finds services like Prodigy, Genie, Compuserve and America Online — subscription-based services that support a variety of communications and information sharing functions. Through America Online, for example, users can get caught up on the daily news from a wide variety of sources, or can connect to the White House Forum to download copies of speeches and policy statements almost as soon as they are released to the news media.

This information providing aspect of these services sets the stage for electronic caves - places where pursuers of knowledge can gather information in their quest for understanding or discovery. Working in isolation, threads of an idea can be pursued through the movement of fingers over a keyboard, rather than by running up and down library aisles extracting references from printed documents. Once the raw information is gathered and downloaded to the user's computer, he or she can then work in privacy to examine, interconnect and otherwise draw meaning from the results of the search.

While telecomputing services provide one form of electronic cave, libraries of information, images, sounds, movies, and programs — all stored on CD-ROM's — provide another. Each CD-ROM, a plastic disc the same size as that dominating the music industry today, can hold the equivalent of 275,000 pages of single-spaced text-information that in printed form would require the sacrifice of 23 trees just to provide the paper.

One of the greatest merits of the electronic cave, whether it is accessed through phone lines or through laser beams hitting a plastic disc, is that information of interest can be found with automated searching methods that free the user to concentrate on the underlying quest without being encumbered with the magnitude or dynamics of the searching process. This capability stands in stark contrast to information published in paper form. For example, short of reading an entire document to isolate a particular piece of information, most of us depend on the document's index to narrow our search. However, many documents lack an index, and those that do have one may not have entries for the topics of interest to us, or, if they do, may list those entries under key words other than those we might choose.

In the electronic world, once a document is loaded into a computer, the occurrence of any word can be pinpointed in a fraction of a second. This power of electronic searching allows us to keep our quest foremost in mind — it lets us explore conceptual space at the speed of thought.

H. B. Gelatt correctly states, "While information is food for thought, it isn't the whole meal." By simplifying the process by which information can be located, our computers simplify the harvest of background information from which we synthesize and extend our own discoveries in our quest for knowledge and wisdom.

Telecosmic nightmares — when nothing works...

The power of computer-based multimedia and telecommunications can be harnessed to provide modern analogs to our primordial tools of learning. Left to our own devices, many productive users of technology have gravitated to their own best mix of these applications. The challenge that faces us comes from institutionalized attempts to see technology as a replacement for one aspect of these modes of learning without thinking about the need for balance.

On several occasions I've had the opportunity to conduct courses for educators through "distance learning." I was located in a television studio, and students were located in cities all over the country where they could see and hear me through satellite transmission from my site. The return path from students was an 800-number they could call to respond to me by voice. Students could not talk with their peers at other locations (although they could, of course, talk with peers located

at the same site.) The studio in which I was located typically had two cameras — one fixed on me framing head and shoulders, and another located above a drawing pad on which I could place printed "overheads" or draw on paper with a pen. My movements and gestures were hampered, and spontaneity was made difficult because I couldn't see any of my audience. Furthermore, voice contact lacked spontaneity because of the time delay associated with shipping my signal through a geostationary satellite located some 24,000 miles above us.

Since my style is highly interactive, I found this environment to be quite stifling. On the other hand, I've encountered some educators who just love it. From their perspective, it doesn't matter if they see their students or not. They are content to be the talking head dispensing information to an invisible audience. As far as they are concerned, their role is not to engage in human discourse, it is simply to present information and hope it is received. This is a weak attempt to create a campfire whose embers are all but extinguished by the oppressive atmosphere of educator as the font of all wisdom. Watering holes and caves are nowhere to be found in this world.

While existing distance learning environments of the type I've described may be helpful to those for whom other options are not possible, I see them as high-tech replicas of a classroom model that dates back to the Church of the Middle Ages. One must remember that the function of the Church was to make us believe, not to make us think.

Telecosmic dreams...

In the world of slow telecommunications, the multimedia campfire was far removed from the telecommunity's watering hole. Now that perceived bandwidth is increasing by leaps and bounds, and the price of high-speed access to the Net is dropping, these two worlds are starting to merge.

One has to be careful when bringing water...

High-bandwidth is merging multimedia and telecommunications in highly portable devices that used to need connection to walls for 2 reasons, now one, soon none. High-bandwidth telecomputing with a mix of images, animations, sounds, text, etc. will be ubiquitous. As a result, campfire, watering hole and cave come together in a new synthesis — the modern day alchemist's retort — from which we can distill the essence of learning environments that truly meet the needs of all learners whenever and wherever they are.

About the Author



David Thornburg is an award-winning futurist, author and consultant whose clients range across public and private sectors in the United States and Brazil from startups to some of the world's most dynamic corporations.

He is founder and Director of Global Operations for the Thornburg Center and Senior Fellow of the Congressional Institute for the Future. He conducts research and provides staff development in educational futures, multimedia, communications, and whole mind education. He helps clients to explore ways that telecommunications and multimedia will change learning at home and in the classroom.

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