

From here to

by David Boulton

The other night my 5-year-old son Daaron and I went out for one of our evening walks. We like walking at night. It blends energy and subtlety-mindedness, and helps us tune into really being together.

Normally when we walk we avoid bringing any toys or things that may be distracting. Walking is a special discovery time and we both enjoy discovering who we are and whatever else we encounter as we trek around the neighborhood. But, on this particular night Daaron was rather set upon bringing his latest “construx” creation. He was very enthusiastic as he told me that he had “a new invention to share.” So I said, “Ok, bring it along.”

The “device” (his word) had a body like a jet cockpit, wing-like struts which proceeded from its sides, a small spinning cylinder for a nose and a curious handle connected to its rear end. On first sight I wondered if it was a space ship, a magic sword or, possibly, a PK valence meter (the Ghostbuster meter for detecting slime).

At first as we walked and talked he said nothing about his new invention. But, as we encountered a “roly-poly” bug, Daaron and his device sprang into action. Dropping into his curiosity crouch he placed the invention, as if it was some kind of magnifying glass, between his face and the bug. As he got closer, strange whirling and clicking sounds came forth and in Daaron’s best imitation of synthetic speech, the invention began describing all that was known about roly-poly bugs. At points, Daaron stopped to show me “visuals” on the device’s make believe display—how the bugs legs worked and how great the idea of rolling into a ball was...much better than a snail’s shell.

As I crouched alongside rather speechless, Daaron went on to describe the Device as his “radar helper.” He said that it would work on anything — telephone poles, cats, stars, trees — no matter what it was focused on he would get pictures and sounds and be able to ask questions and immediately understand whatever it was he was curious about.

For reasons that will hopefully become clear as this article progresses, I was delighted and stunned. Over the

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A philosophical

journey toward

understanding

the learning

process

implicit

remainder of our walk Daaron stopped dozens of time to use his “radar helper” and, I think, make sure that I understood the significance of his invention — “Dad, don’t you think every kid should have one these ”

Jump...

About two years ago I used a C and microphone to record a group of 5- to 7-year-olds as they were playing Nintendo games. I wanted to understand what made the Nintendo experience so engageable for children. Having wired them up, I asked them to describe what they were doing and then became invisible.

From previous observations it was clear that themes (i.e., Batman, Turtles, etc...), whi y sounds and sophisticated color graphics were not the real issues. While they attracted the child’s initial interest, some of the most apparently spectacular games were missing something that others far less so had — the ability to sustain the child’s engagement. My hunch was that underneath all the multimedia whi -bang engagement

was a relationship quality between child and game that emerged if the game’s deeper rhythms of play were compatible with the child’s nervous system.

What I discovered was that the most engageable Nintendo experiences shared certain “deep dynamics.” They all involved moving through a matrix of challenges and obstacles, learning certain movement skills and dexterities, using one’s “energy” or “lives” judiciously, and most importantly, learning when and how to free e the game playing, jump “off-line” to a resource screen, select a resource with which to overcome an obstacle, re-engage the play screen and employ the resource to move ahead (resources might be ladders, hammers, magic potions, jewels, rafts, money, food, a consulting wizard, etc.).

I still remember how I felt as I started to see beneath the surface of the game playing. The conceptual dexterities of these kids were stunning — here they were manipulating a rich tapestry of logical types, levels of inference, multiple contingencies, numerous specific meanings—doing it all very dynamically — and all with an effortlessness that was breathtaking to behold. I couldn’t help but think they were practicing the

future—not the content—somehow, I felt, they were practicing the future process of processing. How was it that these kids could deal with so many interrelated contingencies and meanings at once

Asking that question and reviewing the tapes, I saw there were cycling rhythms of challenge, frustration, creative resource application and renewal that were at the core of why they enjoyed playing the games.

es, the sound and graphic effects were important components, but it was the way the games allowed the children to creatively act upon their own frustrations—the cycle of relevancy, challenge, frustration and resolution—all happening in real time compatibility with the ACTUAL child’s attention, that I found to be the key.

Small (Quantum) Jump...

Just as our eyes see optimally only a particular range within the frequencies of light and our other senses particular ranges within the frequencies of matter

— what if our nervous systems have an overall optimal range for resonating meaningfully with our environments? For *co-implicating* the not-nowness of our memories and the all-at-onceness of our senses into the stream of our consciousness? What if underneath all the issues of content, logic and pedagogy there is a more basic issue - the intrinsic dynamics of how a multiplicity of meanings implicate one another and punctuate the rhythms of engagement?

Jump...

About four years ago I began asking some of my friends: When you're reading a book and encounter a word or term that you don't understand do you a) put down the book and dig into your references or b) just move along and hope it's not important or, that if it is, further reading will fill it in? In other words I asked: What do you do when you have a "need-more-meaning" impulse? I wasn't surprised to find them saying that if the material wasn't critically related to their jobs they just skipped over whatever they didn't understand. Stopping to look things up, even when the references are handy, is just to distracting

Questioning literate adults about what happens while reading a book is almost like asking about their breathing. So I took the point one step further, I had them remember back to when they were a child in school and asked: How many times did you raise your hand when you were curious or uncertain? Like my own memory of being in school, my respondents all said "not too often". I then asked, how often were you uncertain or curious in class. Again, like me, they tended toward "a lot more often than I raised my hand".

What I was fishing for was how these "learning environments" unintentionally stifled the expression of a person's curi-

highly motivated learner I often found myself disengaged from learning. How was it that I could be moving along, engaged and full of interest one moment, and disengaged and drifting the next? I discovered that there were many reasons but that the only ones I could do anything about (short of food, sleep or a soundproof room) were ones related to how I resolved my own "meaning needs". If I didn't follow up on something I was uncertain or curious about, two things happened. **First, I passed over something I arguably needed or at some level desired to learn. Second, and more importantly, in doing so I was tacitly *dulling* myself to **being** uncertain or curious. The more I thought about the latter point the more I was convinced something was wrong. How could I ask questions, how could I participate in my own learning process without a *sharpened* sense of my own uncertainties and curiosities? What other "compass" do I have?**

Jump...

Today people on the cutting edge of organizational design, management theory, general systems thinking, representational democracy, whole person health care, peak performance studies, psychological and somatic therapies (and a whole lot more) are converging on one another. Today, the Rome that all roads lead to, the common and central dynamic that underlies performance and wellness in all individuals and organizations, is learning.

In other words, in the face of an unprecedented rate of change, cultural evolution is beginning to select "learners". **From a purely pragmatic standpoint the reasons are simple: yesterday's knowledge doesn't consider today's contingencies, whereas learning today can include without being limited to yesterday's knowledge. From**

ever know about who we are, what we are, why we are, how to do things and how to change things, individually and collaboratively/collectively - we will have learned. The greatest natural resources on earth are "learners".

Paradoxically, the problems of education are in large part due to the fact that for hundreds of years the role of education has been to produce "knowers" instead of "learners". Facilitating the development of persons who are able to continually learn is a significantly different objective than producing people who can remember information or systematically repeat skills. Changed almost overnight by the advent of modern computer technologies, the world no longer needs human data bases or robots - it needs learners who can adapt their activities, including using these new technologies, to what is happening new each day.

No matter where in the spectrum of thought you stand, once you've seen learning's profoundly practical significance, learning to know and learning to do give way in priority to the deeper issue of learning to become *learning oriented* - the hallmark of a learner. The questions for educators and parents then become: how can we facilitate our children's capacities for learning and how do we help children discover their natural appetite for learning to learn.

Jump...

It's 2010, your 7 year old grandchild has just returned from a vacation in Yosemite where she discovered the wonder of trees. She is watching a clip on environmental consciousness with her **INVISOR** when a beautiful tree in the background reminds her of the questions that flooded her mind at Yosemite. The invisior tracks what she looks at and so when her eyes pause to look at the tree, and she says "more", it knows exactly what she means. The invisior zooms in on the tree and informs her

through familiar icons that she can explore “trees in general” or explore this particular “kind of tree”.

By slightly moving her finger she selects “trees in general” and a new series of icons appears that offer her half a dozen ways to travel further. The “time machine” icon, she knows, will allow her to look at the broad scale evolution of trees or at the comparatively short scale growth and development of an individual tree. The “shrinking machine” icon will allow her to become a “virtual shrunken observer” and travel inside the tree examining its inner forms and processes. The “space ship” icon will allow her to examine the macro role of trees from a global - “orbital scan” perspective.

Just in case she doesn't want to explore such depths, three “advisor” icons allow her to watch and listen to a “storyteller”, a “scientist”, or a “tree expert”, who like “talking heads”, will walk her through the major significances, of in this case, “trees”.

After a quick jaunt through the time machine where she watches in time lapse the seed grow out of and into the ground - witnessing the intelligence of the tree as it grows in response to the sun and the terrain and other trees which make up its environment, she selects the “storyteller”. Because she is interested in practicing her Russian, she also sets her invisitor for bilingual (Russian/English) operation. If she gets stuck in Russian the system will have an English “safety net” ready to help her. Moving on she sees that there are many stories and myths available. As she encounters the one entitled “gravity dancers”, the word gravity causes her to pause and when she says “more”, a new series of icons appear.

These new icons deal with different classes of reference support. One is for quick, concise help similar to an old dictionary or thesaurus, another is for elaborations similar to old encyclopedias, the “in context” icon will clarify the word's specific use

and still another will cause the invisitor to reorient itself and make “gravity” the central thematic domain. After having gravity pronounced (the voice in her head had trouble with it), she decides to really explore gravity and come back to trees later.

The “time machine”, she knows, will allow her to see gravity at the broad scale, evolutionary level...

Co-Implication

By nature, whether for knowing, doing, or being, learning is a process of extending the capability to be relevantly present to what is being experienced.

We need to be careful about the distinctions we make between the roles of interpersonally facilitated learning and technology mediated learning. Being relevantly present (being present) to another human being is a significantly different process than being present to a continuum of abstract facts and concepts. To be present to another human being begins with an openness that can be characterized as minimally mediated. Being relevantly present to an algebra exercise implies an artificially constructed mediating context.

From a learners perspective, there are areas of the curriculum and more importantly life that are best facilitated by interpersonal and direct contact processes. Technology is not a substitute for (though it can at times augment) collaborative, co-mentoring, team teaching, group dialogue and of course, one on one, relationship processes. Similarly, actually contacting and caring for other forms

**There is great potential for David Boulton's ideas.
The subjective meaning paradigm and theory of
learning and (overall) direction ring true.**

**Michael G. Fullan, Dean, Faculty of Education
University of Toronto, Canada**

**This is “right-on” what has to happen to fundamen-
tally change the nature of the learning situation.**

Bob McKinley, Catholic Education Center

of life from flowers to animals is entirely different than learning about them in text books or on video disks. But just as there are aspects of learning we need to minimally mediate, there are aspects of knowledge which by its nature is so abstract that it is best facilitated through a technology-mediated relationship with information.

Traditionally, we tend to view educational technology in terms of its ability to augment and enhance what teachers and learners do. But this is a bit circular because what teachers and learners do, indeed what education at large does, has been *framed, enabled and constrained* by the technologies used in the past. It must be remembered that everything about our relationship with information is technological anyway. These words printed on the page you're reading, what they mean to me and what they mean to you, are all technological processes. You and I have both learned an "inner interface", an inner technology which transforms symbolic information (also a technology) into a process within us, wherein various past experienced meanings *converge into relevancy*. We invented it all. There is nothing to be romantic about.

Emphasizing that the individual is the most important subject will certainly help students with their self-esteem and learning processes.

Paul Britton, District Career Prep. Coordinator CUSD

This was totally new to me — after 23 years as a teacher. This "idea" could radically change how and what we do in the classroom.

Grant Wilson, Computer Coordinator

Of all the relationships children have with their environments, their relationship with information represents an environment that could, with the help of modern technology, very effectively model the new learner-oriented learning paradigm. If we could re-craft our relationship with information so that it better corresponded to the way our nervous systems have evolved to learn - have evolved to process meaning - that new relationship would be based on responding to the immediate (micro time) meaning dynamics of the individual who is learning. This is the destiny of technology in education.

As I have tried to point to with each "jump", the real issue is relationship. The relationship a learner has with the environment supporting or actively facilitating learning is the single most important aspect of learning. In order for a learning environment to facilitate learning it must be responsive enough to the actual individuals' needs for meaning to encourage him or her to employ those needs

in driving the learning process.

For a learning environment to steward the learner's sensitivity to his or her own meaning-needs (internal) while at the same time facilitating their integration with rule-based critical thinking skills (external), it will need to employ, in addition to explicit pedagogies, a new general relationship model designed to do so. **This requires a different conceptualization of the relationship between learners and information intended to facilitate or re-source their learning. One in which access to knowledge, everywhere possible, is organized and made available according to the relationship-with-meaning-needs (in time and context) of learners rather than the structural conveniences of the subject material or the mediating technology.**

This is the significance of Daaron's invention and the Nintendo observations. Essentially what he conceived of is a companion that responds to his immediate curiosities and uncertainties. Nintendo confirms that the "disengagement" issue isn't just an artifact of the classroom or textbook. Special media effects aside, if children can't resolve the tensions produced by the uncertainty surrounding an obstacle - in time - they become too frustrated and dis/engage. If however the environment does provide them with ways to **resolve** their tensions, through resources available to them - in time - they can apply their significant conceptual dexterities for as long as the subject/activity remains relevant and challenging (and their teachers or parents will let them).

We all need INVISORS.

“Learning is a process of extending the capability to be present to what is being experienced”

Implicitly

The technical capabilities to provide learning environments capable of dealing with any subject-content in ways consistent with what I have described exist today. Not the “radar helper” or “invisor” as stated, but the relationship principles they both imply. The problem isn't even one of cost. Systems capable of totally transforming our relationship with information, of providing a new (**learner**) interface to recorded knowledge, will ultimately prove to be very cost-effective. But, so long as the role of educational technology is viewed in terms of isolated subject mastery rather than as *a mediator of a new general relationship*, albeit one a ways off, its evolution as a force in educational evolution will remain mis-directed and what I have described will not be considered relevant.

I mean by this new “general relationship”, a relationship whose central intention is that learners learn to experience the significance of **how they are learning** - learn to develop their own subtle participatory “sense” of learning - learn that the compass with which they can orient themselves, regardless of the subject, emerges from *their own* meaning needs - their own *fluctuations of meaningfulness*. Thus, a *learning oriented relationship*, a way of mediating the learner and world which is relevantly responsive enough to encourage and enable learners to “follow through” with their own meaning need impulses. To become clearer about, and more discriminately trusting of those impulses; and to begin to learn the inner instrumentation of their own personal learning process.

Such a relationship implies an inversion in our thinking about educational objectives: As the paradigm

shifts from “knowers” to “learners” the education process must be turned inside out. Facilitating persons who are able to continually learn (learning oriented human beings) is a significantly different objective, calling for a significantly different goal orientation than depositing knowledge into people. **Thus, rather than viewing our capacities to learn as the means through which we acquire knowledge and skills (become knowers), we must see, knowledge and skills as the means through which we exercise and extend the range of our capacities for learning (become learners).** As this inversion dawns, as we begin to view “subjects” as *seminariums* - as the exercise environment and apparatus in which people learn to participate in, and extend, their capacities for learning - then “subject mastery” will become an implicit consequence of the process through which individuals learn to become learning oriented and our educational systems learn to facilitate learners.

I am suggesting that if we focus on the relationship - on developing a *mutually learning oriented relationship* between education as a system, educators, and learners - and then work from there towards the role of methodology and technology in mediating it, an entirely different paradigm can emerge. One that will not only evolve more quickly into consistency with

what we know about learning but that will also give rise to entirely new classes of machines, machines designed from the ground up for learners.

Learning Insights, a company I founded to learn about these issues is exploring and developing just such an approach today.

The “learner-interface” and information processing systems we are developing will provide the same navigational, representational and referential dexterities as those of the invisor. Our goal is to develop a generalizable and economically deliverable learning environment. One, that can be run on existing personal computers and that will ultimately define a new class of machines - machines, designed entirely to facilitate and exemplify the kind of relationship we have discussed - one centered on responding to, empowering and enlivening the learner.

Toward these beginnings, I spend part of my time with Learning Insights and part of my time at Apple University learning about, experimenting with and creating learning environments. And, pervading and extending beyond both of these, I spend all of my time trying to learn about the depths of the significances of learning and how to change our relationships with them. And, of course, I take plenty of walks with Daaron.



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