

Using technology in toys to create playful learning interactions

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I want to start with an uncomfortable truth we all are aware of: Our understanding of technology on development, whether in toys or anything else, is very poor. I think there are several reasons for this:

No “Holy Scripture.” Piaget and Vygotsky produced their seminal work well before the electronic revolution. Vygotsky had been dead for years! Neither theorist said anything about modern media and so we have nothing to guide us, to serve as a starting point from which to build theoretically.

There is a generational difference. Electronic media and technology proliferated rapidly only in the past twenty years or so, and it is OUR children whose toyboxes are filled with electronics. Faced with these new playthings, so different from what we played with, we have been bewildered and confused about what to make of them because they do not resonate with our own childhood experiences.

Distaste. Toys are heavily commercialized products, and these days are almost always associated with media properties – movies and television programs. The content of much of these media is often repugnant to many developmentalists, who recoil from both the programming and the collaboration of media companies and toy companies in creating products that influence play.

I think the most significant reason, though, is a conceptual problem. We tend to think of technology in terms of virtual media: Video games, internet chat rooms, etc. These places exist onscreen and in the mind only. They lack any physicality worthy of the name. Toys, however, are physical. They are actively manipulated by children during their play. Technology used in toys is inseparable from the physical, so it doesn't fit in with our general ideas.

Whatever the relative contribution of these reasons, the problem of how to think about technology toys remains. And I would like to suggest a possible way out of our problem, a more productive way to think about technology in toys, from the point of view of someone who was researched and designed such things for more than a dozen years.

First, some orienting information. Toys are not made by elves at the North Pole. They are made by underpaid factory workers in Asia. Toys are produced to make money. Economic factors such as manufacturing cost, price point, cost of goods, marketing forecasts, package size, etc. all take precedence. The play experience is last.

Technologies are added to toys because they are a cost effective way to add value in the eyes of consumers. Marketers will tell you that technology makes toys seem “modern” and “fresh.” Technology adds “sizzle,” or appeal, to a toy. Parents and grandparents also see technology as adding something to the play experience, as well.

Does it? Unfortunately, usually not. There are not many developmental psychologists in toyland, and there are even fewer who understand much about play. Most toy companies hire psychologists to help them with school-related curriculum, which is unlike play in virtually every way.

However, there are gems among the dross. Technology is added to toys in dozens of ways, and the good examples tell the tale.

First, consider the Barney Banjo. This toy resembles a banjo or guitar, but the sound box is an open ring. A light sensor in the ring is triggered each time children insert a hand in a pretend gesture of strumming the instrument. The result is that the instrument actually plays a few notes. The music starts and stops with the strumming motions, and is controlled by the child. This toy is great because it is a pretend gesture made flesh. You can “really” make music come out of this pretend banjo by making a pretend gesture! In social situations, other children will dance to the music or sing along. The role play experience of being a musician is wonderful.

Next, consider Hide-and-Sneak. This toy has two parts: Small transmitters that give off a radio signal, carried by the players who hide, and a “wand” carried by the one doing the seeking. The seeker device chirps with increasing intensity as it gets closer to the small transmitters, so in addition to her eyes, ears, and mind the seeker now gets an additional “sense” to aid in finding the hidiers. It is like magic, or like having Mr. Spock’s tricorder from Star Trek. My experience has been that after a few games of hide and sneak, children start experimenting with the toy, to answer questions like: How far can the seeker register? Can it go through walls? What if I am running when you are trying to seek me? Etc. This toy not only adds a fun element to existing social play, it also supports exploratory and experimental thinking as well.

And the Spy Tracker. This toy has four pieces: Three motion sensors and a base station. The sensors alert the base when they are triggered. The base has a drawing space for a map. When playing with this toy, children spend time drawing the map, figuring out where to place the right sensors to be in order. The sensors themselves require the right placement. What if the cat sets it off? A homeland surveillance toy that invites reflection, on a variety of levels.

The above toys are 'theory-less,' in the sense that they were not designed with a specific developmental goal in mind. However, there are toys that are based on developmental viewpoints.

Meet Interactive Barney. The developmental idea behind the Barney and Friends TV show is that traditional play is best. There is music, collaborative play, basic numbers and letters, and even nursery rhymes, all conducted in warm social interactions. Interactive Barney is designed to deliver that experience as a toy. Squeeze his toe, he sings one of a dozen songs. Squeeze his hand, its nursery rhymes. Cover his eyes, he plays peekaboo. And peekaboo is the most popular. Children cover his eyes with pillows and blankets. One child put him in a room and then sat outside, turning on and off the light, listening to Barney comment on the changes.

And here's Po. The Teletubbies also have a developmental theory behind them. Intended for infants and toddlers, the model is defiantly anti-verbal. Words get in the way. The Teletubbies emphasize the visual, the aural. In this toy, the tummy is a button that plays music with graphics synchronized with the music. The games in the toy were designed based on simple visual principles that infants have been shown to discriminate and respond to, such as symmetry, simple part-whole relationships, and repetitive patterns. Infants and toddlers sit and interact with this toy, experimenting with different actions, nodding along with music. Their sustained attention to the toy was significantly longer than typical. Children using this toy often found they could create situations where the screen was completely dark. They would then tease the adult sitting next to them, "Where did it go?" and then squeeze a sensor to bring the image back. And giggle.

You can quibble with the Barney and Teletubby versions of development and what's good for it, but at least they have an idea.

I show these examples to illustrate how I think we can start theorizing productively about technology in toys:

- 1) The use of technology in these toys is so diverse that one word, 'technology,' cannot cover them all and still mean anything. Asking 'How does technology in toys affect development?' is like asking "How does plastic in toys affect development?" The question is too broad to be productive.
- 2) Technology disappears into the toy, and becomes inseparable from the play experience in any simple way. The play experience has to be viewed as a whole, of which technology is only one element. Trying to isolate that one element makes no sense when the play experience itself is based on the technology's playing an integral part.
- 3) A good place to start is to identify technology toy play forms that stimulate and encourage playful efforts, and define what the characteristics of "quality play" with technology toys can be like.

Technology in toys is a trend that is here to stay. It is already ubiquitous, and it is only getting cheaper. Toy companies greedily absorb psychological studies. The “Baby Mozart” movement was driven, rightly or wrongly, by a research study. If we devoted ourselves to placing the new generation of toys in a developmental framework, we CAN influence toy designs. By ignoring technology toys, we let the market decide important developmental questions instead of science and research. That’s an abdication of our responsibility that must be corrected if we are to have any credibility in claiming we are serious students of children’s play and development in the 21st. century.