"Against the Natural Order of Things"

Why E-Learning Refuses to Take Off

Jonathan Baldwin

> I've come up with a set of rules that describe our reactions to technologies:
>
> Anything that is in the world when you're born is normal and ordinary and is just a natural part of the way the world works.
>
> Anything that's invented between when you're fifteen and thirty-five is new and exciting and revolutionary and you can probably get a career in it.
>
> Anything invented after you're thirty-five is against the natural order of things.
>
> —DOUGLAS ADAMS, *THE SALMON OF DOUBT*

The Pace of Change

I recently attended a talk by someone who enthusiastically told the audience about all the "new" things technology would soon allow us to do and how it would transform education. He pitched it not just as disruption, which can be a positive, but (rather gleefully) as destruction; e-learning, he told us, sounded the death knell for universities as we know them.

There were distinct groups in the audience. When he predicted we would soon be embracing tools such as Twitter in our teaching, I could tell many in the room had, like me, been using it as a teaching tool since it first appeared and were somewhat surprised that it was still worthy

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of being called "new." However, there were some in the room who had clearly never heard of Twitter, never mind used it.

I have been to several talks like this over the past fifteen years or so, and they never seem to get much further than predicting how technology will make everything we are doing now look silly. The message is the same; only the technology they use to project their predictions on the screen changes: in the early days they used slides on a carousel, then overhead projection, then data projectors dragged around in a suitcase on wheels, and more recently transmitting images wirelessly to a large screen.[1]

I find myself wondering why e-learning is still seen as new, despite the fact that I and many others have been doing it for nearly two decades or more. I couldn't quite believe that one audience member admitted at the end of the talk that he had never heard of MOOCs and I was shocked that the idea of using an iPad to hold a video call with a student on the other side of the planet was still seen as revolutionary. There is a large group of educators who remain outside the bubble and who are almost blissfully unaware of what is going on. When told about it, they respond in the same way as if they'd been told that their favorite brand of washing detergent had a new, improved formula: polite but mildly annoyed.[2] But there is another group for whom the basic concept of e-learning is still the subject of intense debate and rather a large amount of FUD (fear, uncertainty, doubt) gleaned from articles about plagiarism (students just copy their essays off Wikipedia!), high dropout rates (nobody finishes an online course!), heavy workloads (I'll have to assess three thousand students!), and plots to do away with academics altogether (if I put my course online, the university won't need me anymore!). All these arguments, in one form or another, have followed me throughout my career as a lecturer, manager, and advocate of technology-assisted or technology-facilitated learning.

Technology has changed drastically since I started teaching. In 1999 there was no broadband, most monitors were 256 colors at 640 × 480 pixels, Apple was about to go out of business, AOL was most people's idea of what the Internet was, and getting your e-mail meant dialing up on a very loud modem, grabbing your messages as quickly as possible, and then disconnecting before your phone bill mimicked the national debt. But the debates surrounding e-learning have hardly changed at all. We are still experimenting and wondering if any of this will ever catch on when, by Douglas Adams's maxim, the vast majority of academics should be more than comfortable with technology in teaching and learning.

In this essay I want to explore why it is that e-learning hasn't taken off in quite the way many have predicted at various times. Is it because of an inbuilt Ludditism among academics? Or overpromising on the part of enthusiasts? Or is there, as I suspect, a fundamental problem with the way technology is talked about?

Two Anecdotes about the Future from the Past

A former colleague worked in computing back in the days when a computer was supposed to take up a large part of a room. He worked for a firm that was producing computers that could, in theory, sit on the corner of a desk.[3] That was quite radical. But they discovered that in order to sell them, they had to put a concrete block in the computer casing so that it was extraordinarily heavy.

In 2013 I sat in a packed cinema to watch a 1965 science-fiction movie. The hero takes apart a mind-controlling device and, poking around among wires and large transistors, describes it as "highly sophisticated." The audience burst out laughing. But I remember watching that same scene on TV as a child in the 1970s and being rather horrified by it. At some point between 1965 and 2013 that scene went from awe-inspiring to laugh-out-loud funny.

Why did early personal computers need to be heavy to be accepted, and why did an electronic mind-controlling device go from being horrific to comical?

I'll return to these questions later.

Innovators versus Luddites

Looking back, I was both cursed and blessed to be born when I was. Blessed because of all the new inventions coming out, but cursed because I seemed to work with people who could not see their potential.

For my first job interview as a layout artist, I arrived with a portfolio full of leaflets I had created in the new Aldus PageMaker on an Apple Macintosh SE. The man interviewing me entered into a long lecture on how I had wasted my time and that what he needed was someone who could use a scalpel and cow gum. As far as I know, he was out of business eighteen months later.

A few years later, in an attempt to persuade the FTSE 100 company I worked for that they should take this new thing called the World Wide Web seriously, I demonstrated a site I had created in my spare time. Our finance director dismissed the idea, stating that the amount of money we would need to spend on it (a few thousand pounds) would never be recouped, and the Web was a fad that would never replace traditional stores. Today that company's website makes more money than all its stores put together.

It was shortly after this that I made the move into education to help set up an online course. The year was 1999—in technological terms it might as well be a hundred years ago—and the idea of online learning had a whiff of science fiction about it.[4] The stumbling blocks I ran into have

remained the same to this day: fears that this was a way of getting rid of teachers, protestations that people could not learn without face-to-face interaction, suggestions that while it might work for other disciplines, it would not work for [insert any discipline here].

This reaction to technology, particularly among people whose way of life or jobs are potentially disrupted, is nothing new. In Britain during the nineteenth century, textile workers reacted strongly to the invention of new machinery that threatened to turn their skilled labor over to unskilled people who were much less expensive and increase the supply of cloth, making their product easier and therefore cheaper to obtain. This group gave their name to the largely pejorative term *Luddites*, which has come to mean anyone resistant to change.

The Five Stages of Grief

Reactions to technology could be compared with the five stages of grief: denial and isolation, anger, bargaining, depression, and finally acceptance. However, the idea behind the five stages is that people move through them, meaning that when it comes to e-learning, the deniers should eventually become accepting of change. But while I've witnessed a lot of denial and anger during my careers in both design and education, in my experience the educators who display those responses do not eventually accept or even embrace it—the anti-e-learning and the indifferent are quite distinct groups from the enthusiasts.

The Diffusion of Innovation

Responses to e-learning are not following what the textbooks tell us to expect. Everett Rogers's (2003) conceptualization of the "diffusion of innovation" will be familiar to many. It breaks down the adoption of new ideas, products, or services into a process that moves through the population via distinctive groups:

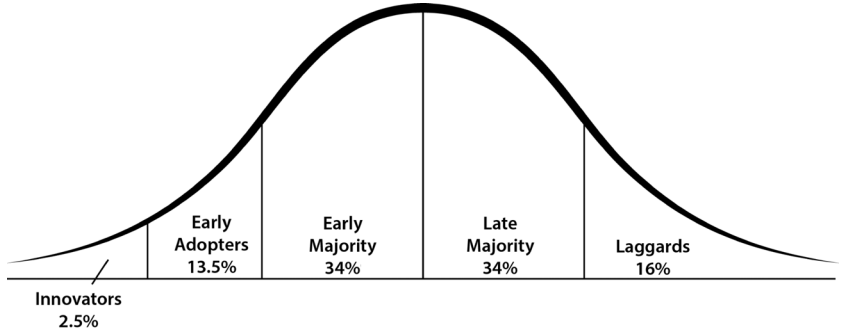
Innovators (2.5%)

Early adopters (13.5%)

Early majority (34%)

Late majority (34%)

Laggards (16%)



In this model, a new product has to be taken up by the innovators who give it something of a shakedown and, hopefully, evangelize to their friends, who potentially become the early adopters once it has become more widely available and cheaper. The laggards are the last group to catch up and are, in the words of Simon Sinek, author of *Start with Why* (2011), the kind of people who only bought touchtone phones because they stopped making phones with dials. By the time the laggards have adopted something, everybody else has already moved on to something else.[5]

While the diffusion model is useful, something odd seems to be happening when it comes to e-learning. Despite the fact that some of us have been involved in e-learning for twenty years or more, we don't seem to have moved much beyond the early adopters. My guess is that only around 16 percent of educators in the United Kingdom are actively embracing e-learning.

Predicting the Future of Technology

At the time of writing, YouTube has a growing collection of videos about predictions of the future going back to the 1920s (see the General Motors ride at the 1964 World Fair for one example: www.youtube.com/watch?v=2-5aK0H05jk). One such video, from Microsoft (www.youtube.com/watch?v=9V_0xDUg0h0&feature=youtu.be), gives an end-of-century view of the smart home of the future. Time has not been kind and the things they got right are lost among the things they got wrong (wait for the scene with the pocket PC).

A more recent video is a live presentation at the Consumer Electronics Show of Samsung's home of the future (www.youtube.com/watch?v=mEzSF29EBgI). This shows a number of devices that at the time were close to being available, but rather than use a family setting, the focus here is a professional single woman in her thirties.[6]

Another video produced by NTT (Nippon Telephone and Telegraph) is well worth a few minutes of your time. It shows how they think technology will be used in a variety of situations such as remote conferencing, education, disaster relief, and medicine (www.youtube.com/watch?v=GpJ36KzHJG4). This is a typical example of the corporate prediction genre, which typically groups together quite disparate ideas under a (very) loose narrative.

A fourth video is rather more famous and dates from 1987: Apple's Knowledge Navigator, created for a presentation to higher education managers (www.youtube.com/watch?v=9bjve67p33E). Apple's video directly addresses the future of education and the ways technology would change it. Given the audience for the video, it focuses not on teaching but on an academic checking his e-mail, doing research, and video conferencing with a colleague in another country.[7] The video slowly began to attract a lot of attention, leading Apple to produce another in 1988 focusing on students, with various speakers predicting the future of computers in the classroom (www.youtube.com/watch?v=VWlA_cDE5RU&feature=youtu.be). Two minutes into the video a child gives a presentation about volcanoes to his peers using what we would now identify as an iPad. The video is full of predictions that turned out to be accurate, but also a few misses.[8]

Why Technologists Are the Wrong People to Predict Future Technology

For the first seven minutes, Apple's 1988 video seems rather prescient. The things it shows are things we now take for granted. But then something odd happens. A woman is designing a new aircraft engine on screen using computer visualizations to model the effect of different nozzle shapes. This kind of thing certainly happens today. But she is talking to the computer, asking it to make the changes, instead of directly manipulating the designs using a pen or mouse. For this viewer at least, there is something of a problem here, and it's not because I'm a Luddite; it's because this prediction goes against the way design is done.[9]

Microsoft's "home of the future" video also contains things we either accept today or are looking forward to in the near future. But the video leaves me cold, not because of the technology, but because of the relationships. Microsoft's video is a prediction of the home of the future, when what it really needed to be was a prediction of the family of the future. Technology should not be the thing that defines family interaction; it should be the thing that enables it. This requires social scientists, not computer scientists.

Samsung's presentation eschews relationships entirely and focuses on

the idea of saving time. All the home's gadgets are automated and controlled remotely. But the ideas themselves are unappealing because, at the end of the day, all that happened was the user got home and fell asleep alone on the sofa. That is not a life to which many would aspire. Like Microsoft, they are selling the technology, not the life.

To explain why the Apple video stands out for the wrong reasons, it is worth thinking about the success and failure of educational games. Gabe Zichermann, in a potted history of gamification, points to the 1980s educational game Where in the World Is Carmen Sandiego? and calls it "the first and last time that parents, teachers, and children all agreed that a game was good for them" (http://youtu.be/6O1gNVeaE4g). But it is also, argues Zichermann, "the first and last time that an educational game was a good game." Why? "Because parents and teachers got involved in the design of edutainment titles. Kids can smell that s*** a mile away. It's not fun anymore. It's work." Carmen Sandiego was a good game because it was made by people who understood games. And that's key: let family specialists explain how families work, let gaming specialists create games, and let educators figure out what to teach and how, adapting tools to help as they see fit.

In the Apple video, up until the point where the designer starts telling the computer to change her concept, the people whose ideas were being realized on screen were educators expressing ideas of which they had direct experience. Those bits worked—they understood how people learn and interact. But the section on how computers would revolutionize design was a non sequitur arising from one contributor's belief that voice input was far superior to keyboard input. He was talking about words—dictating text; for some reason the video's director interpreted this in a field of which, I would wager, he knew little: design. Imagine featuring an artist of the future creating a portrait by instructing the computer to "add hair, make it shorter, more wavy, make it flick across the left eye" or a writer creating a novel not by dictating the words she wants the computer to transcribe but by telling the computer to "add more suspense."[10]

Designers *think* with their hands and articulate their thoughts through visualization and by making physical prototypes, not by speaking. This is why my first job interviewer was wrong: he was rejecting a new tool, believing it was an attack on his craft. But tools don't do anything—they still need to be mastered and applied in appropriate situations.

This helps to explain why many predictions of the future fail: not because the technology itself will not materialize, but because the people doing the predictions are not experts in the situations or domains they are aiming to affect. They develop tools without watching the way people work.[11] This is why their visions strike us as funny, odd, or even offensive. And it's why, when a technologist tries to tell a designer, a doctor, or a teacher "you will work like this in the future," they laugh.[12]

To use Douglas Adams's explanation of why some people refuse to accept technology in their lives, it is "against the natural order of things." But while Adams focused humorously and self-deprecatingly on age, the slow adoption of technology in teaching is less about how old the teachers are (I witness acceptance and rejection equally across all age groups, some of it Ludditism, but much of it not) and more about the nature of the thing being changed.

For those who are focused on teaching in universities, it is often the human interaction that is important. But many people working in universities did not become academics to teach; they are focused on research. As Terry Pratchett puts it: "Many things went on at . . . University and, regrettably, teaching had to be one of them. The faculty had long ago confronted this fact and had perfected various devices for avoiding it. But this was perfectly all right because, to be fair, so had the students" (1994, 21).

So telling someone that technology can replace the need to actually talk to students may be greeted more enthusiastically by those who are not focused on teaching than by the teachers.[13] But showing the teaching enthusiasts how technology can *enhance* rather than replace the things they value is a far better approach than effectively insulting and threatening them, which is how many evangelists come across, because they are evangelizing technology, not teaching (or, put another way, they are evangelizing the "e," not the "learning"). As long as e-learning resides in the purview of school and university IT departments or in technology companies, it will never get past the educational innovators and early adopters, who are operating largely independently anyway.[14]

The Problem with Hype

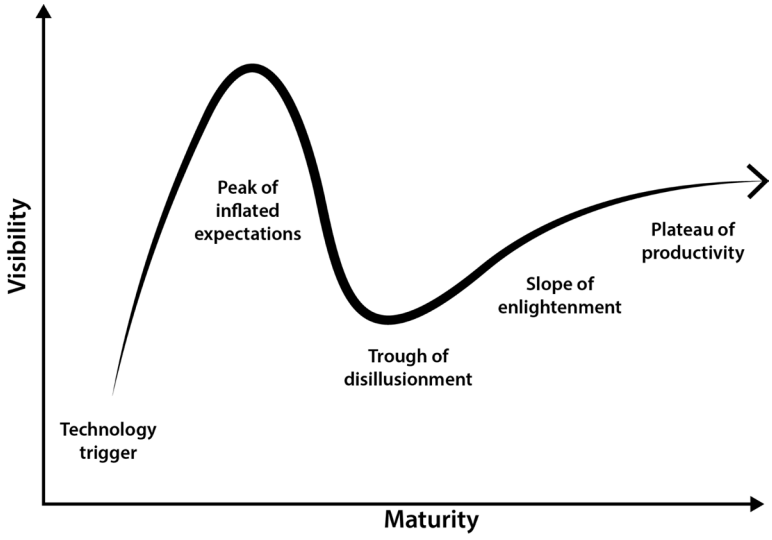
All of the above demonstrates why visions of the future fail to engage if they are proposed by technologists, rather than actual users. Apple's video is the only one of the videos cited that appears to use experts but even it fails to include teachers or students, except as characters. Students and teachers are, to borrow from sociology, actors, not characters. Technologists who ignore the difference are doomed forever to predict things, but never meaningfully change anything.

These videos are somebody else's vision, and the further removed it is from reality the less enticing it becomes. A kind of "uncanny valley" is in effect.[15] Microsoft's family of the future seems not to have any fights; it has a family room, an entertainment room, and a music room—almost, but not completely, unlike my home or that of anyone I know. The kitchen is spotless. Is yours? And because I reject the scenario, I reject the things that apparently create it. Similarly with Samsung's presentation: if the future means I'm rushing to work in the morning so desperately late that,

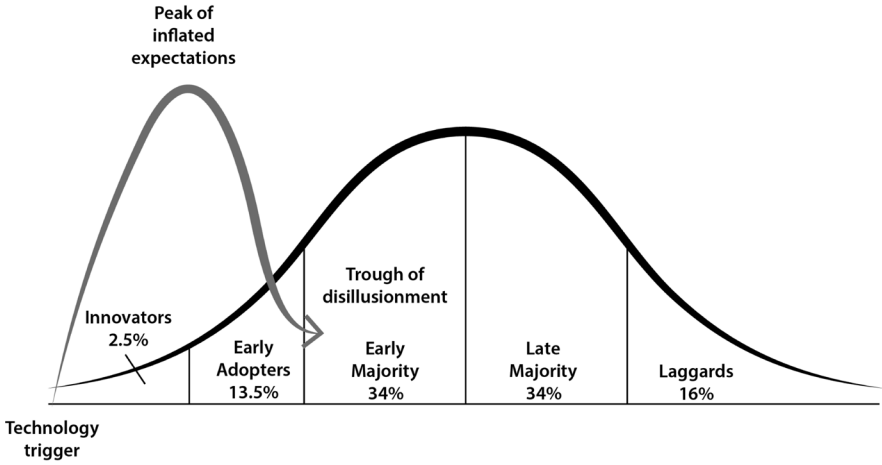
while I can remember to put a single shirt in the wash, I forget to turn on the machine or turn off the air conditioning, and then I get home so late I don't even have time to eat before I fall asleep, drooling onto the sofa—that's not a great vision. I reject it. As for NTT's video—it seems to be promising a glorious future in which we all get to attend extraordinarily dull meetings while sitting isolated in our cubicles. Reject.

The Hype Cycle

This rejection is predicted in another model, Gartner's "hype cycle" (www.gartner.com/technology/research/methodologies/hype-cycle.jsp). Gartner has applied this cycle to many sectors, including education (Lowendahl 2013). In this report, Lowendahl shows technologies such as education tablets, "mashware," and affective computing as being on the rise; gamification, MOOCs, and adaptive learning as being at the peak; and e-textbooks, cloud e-mail, and virtual environments as sliding in to the trough.[16] Meanwhile, lecture capture, retrieval tools, and open-source repositories are climbing the slope, with e-book readers and self-publishing entering the plateau.



There is something about the idea of the hype cycle that is instantly recognizable. In particular, the notion that technology hits a peak of inflated expectations rings uncomfortably true. But does it explain why e-learning doesn't seem to be following the traditional diffusion of innovation? Why is it stuck with the early adopters?



If you overlay the hype cycle on the diffusion of innovation, the trough of disillusion comes right at the point where the early adopters connect to the early majority. And the slope of enlightenment does not occur because the innovators have already moved on to the next big thing. In other words, the reason why e-learning in all its various guises has failed to get beyond that initial 16 percent is because of the hype. There's a disconnect between the promise and the reality, largely because the people doing the promising are unfamiliar with the practical realities of the situation they are seeking to change.

I think there's a simple explanation for this. Think back to the two stories that opened this essay: the desktop computers that had to have concrete inside them and the mind-control device that was scary in the '60s and '70s but funny in 2013.

The desktop computers my colleague sold in the early 1980s had to be heavy because while our minds could comprehend something as big as a room being reduced in size, we have a harder time imagining that it would be portable. Particularly at those prices. "Always be wary of any helpful item that weighs less than its operating manual" (Pratchett 1998, 178).

The mind-control device in the 1960s movie could have been depicted as a box of pulsing lights (as it might be today), with the same narrative effect, but with no emotional effect. It was depicted using exactly the same type of things that you would see if you opened any radio or TV of the day.[17] That is what made it believable and, as a result, scary. My radio can control my mind? That's terrifying.[18] By 2013, of course, the "sophisticated" electronics were dated, and so the idea the audience was supposed to focus on—mind control—was smothered by the way the message was communicated. But the point is that *at the time* the idea made sense because it was in the hands of a storyteller telling a story in a way that made

sense to audiences at the time, not a technologist pitching an idea about the future to which nobody can relate.

And this is what happens when we talk about the future of technology in education—good, potentially revolutionary ideas are lost because the people with the message cannot tell good stories and often know little about their audience.

We have certain expectations in life, and we hold certain values and beliefs. To convey a complex or new idea, it is usually best to position it within those expectations or connect it to those values. It may come across as dated in the future, but that's not a problem if your task is to make a difference today. If you want e-learning to take off, don't tell someone a story about somebody else in the future; tell a story about them and their students today. The innovators and early adopters occupy two overlapping camps: those who love technology (and so will give anything a go) and those who enjoy an adventure and a bit of risk. The next group, the early majority, like a good story too—but they want others to write it for them and no risk.

Revolutions do not start with a PowerPoint presentation or slick video and a ridiculing of the audience; they start with a belief held *by* the audience and an urge to use that belief to enhance or change something. E-learning will only get beyond the innovators and early adopters when it stops being pitched as revolutionary in itself. Technology is not the revolution, education is. And we need to get excited again about what we want to achieve in our teaching and in our students' learning before we get excited about the technology.

This Will Cheer You Up

I wanted this essay to be positive. E-learning offers us so much, and I consider myself an advocate of its use, not just in enhancing existing provision but in widening access to excellent educational opportunities to those who currently do not, or cannot, access them. That is as much the shop worker in Anytown, USA, or the United Kingdom, as it is the stereotypical teenager in a developing country.

I cited a few videos about the future—now let me cite a couple about the recent past that will simultaneously amuse and distress you: use a search engine to find "Kids react to old computers" and "Kids react to typewriters." Douglas Adams missed a line about anything invented before you were born.

Notes

1. Even as the technology changed, two other things didn't: presenters filling the screen with bullet points they then read out to us as we silently

mouthed along; and almost always standing in front of the screen and having their presentation projected onto their shirts.

2. The insinuation that there was anything wrong with the old formula being a fact unsupported by peer review.
3. A large, reinforced desk
4. It also had the ability to attract phenomenal amounts of money, most of it wasted. The project I was involved with was linked to the UK government's "University for Industry," which led to nearly £1 billion being spent on a network of "learndirect" centers and a bunch of missed targets.
5. I once had a colleague who didn't "do" e-mail. He would type a document and attach it to a blank message. Unfortunately his word processor of choice was QuarkXpress, which isn't a word processor and which only his colleagues on the graphic design faculty had. In the end people gave up and just assumed that if anything he sent was important, he'd eventually come and visit in person to ask why they hadn't replied to it. (Ironically, he refused to use QuarkXpress to do actual design, preferring scalpel and glue.)
6. Families are so last century.
7. The video is set in September 2011 and features an intelligent virtual personal assistant that responds to voice commands. The idea was ridiculed at the time. In real life, in September 2011 Apple launched Siri.
8. Among the things it predicted: interactive whiteboards, tablet computers, and that the United States of the future would still not have embraced the metric system.
9. I realized when typing this that I was in danger of sounding like the man who interviewed me for the layout job I described at the start. Bear with me. I think I get away with it.
10. On reflection, this does explain much of Dan Brown's work.
11. This is an important point. When teaching design, I would emphasize to students the importance of empathy—of observing users in situations, questioning them, including them in the design process. I've had students who have accompanied police on patrol to develop protective gear, spent time with a family in the evening to redesign social housing, and even sat through major surgery to help develop new tools for surgeons. You can't do that by sitting in a studio, and especially not by talking to a computer.
12. Or punch them in the face. That has undoubtedly happened.
13. Let's call this Baldwin's E-learning Paradox: the less interested an individual or organization is in teaching, the more interested in e-learning they will be.
14. That, incidentally, is not a criticism of IT departments, who are often as surprised as anyone that they are suddenly seen as experts in how people teach and learn.

15. The uncanny valley is a theory from human computer interaction that says, "the more lifelike a creation, the more likely it crosses the line from cute to creepy" (Eveleth 2013). Here I am suggesting that the more "perfect" a scenario is, the creepier it becomes.
16. Affective computing refers to devices that evoke and respond to emotions. Adaptive learning refers to educational materials that can be adapted to the particular circumstances of the learner. And regarding virtual environments, I've sat through, at the last count, twelve talks and demonstrations about using Second Life in education, but only one that seemed to achieve anything.
17. Much to my father's dismay, I frequently did that sort of thing.
18. The TV series on which the movie is based, *Doctor Who*, made great play out of rendering the ordinary scary: statues and shop window mannequins, to give just two famous examples.

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