

‘Future Fundamentals’ – Technological Revolutions

By Howard Rheingold

Three questions motivated my own personal quest for better working tools and a broader inquiry into the social significance of the technological revolutions that have happened around me during the past two decades: Is the digital computer a mind-amplifier, the Web a platform for collective intelligence, and the smartphone a tool for organizing collective action? If so, what do we need to know to take advantage of these social and cognitive power tools?

I started out as inquisitive writer in the San Francisco Bay Area, was drawn into the enthusiasm for all things digital that was happening in Silicon Valley and nearby intellectual-entrepreneurial enclaves, learned to think more critically about these enthusiasms as the costs of our magical digital powers began to become visible, wrote books, edited the first commercial online zine, tried my hand as an entrepreneur, and now teach at Berkeley and Stanford. My personal, professional, pedagogical and intellectual quests have confronted me with the same question with each socio-technological wave of innovation: are personal computers and digital media good or bad for our thinking and attention? Do virtual communities and social media increase or decrease our social capital? Will smart mobs benefit or undermine democracies? My extended thinking, discussion, research, and teaching experience in the realms that were opened by these inquiries has convinced me that the answer to these questions is: "It depends on who knows what."

Popular discourses about the technologies that have been built on the microchip have focused primarily on the hardware, the software, the industries, the economics of computer games, PCs, dotcoms. My experiences have convinced me that the most important focus for public attention right now should shift to the literacies that bring power to those who possess them and leave behind those who don't know how to use their telephone as a medical instrument, educational medium, social radar, political organizing tool. Chip fabrication plants, teenage personal computer wizards and moguls, networks of fiber optics and satellites, have played and will continue to play their parts in the distribution of computing and communication power to every human on Earth. But now that devices with such enormous untapped power are in the hands of so many, the factor that will most powerfully shape the resulting social institutions is literacy. My definition of "literacy" builds on the thinking of Neal Postman: I mean the inward-looking skill that enables an individual to read and write, to decode and encode messages with a medium, and I also refer to the external community to which this skill provides entrance.

When people invent a new medium, other people move history in certain ways, and there are historical patterns in the way these movements have evolved in the past. Each one is different, but incorporates, is influenced by, and builds on previous media-initiated change. Transformations such as that following the alphabet, print, telephony, television, the Internet often follow a progression in which the physical capability of doing something new – printing books, linking multiple media into a worldwide web – expands the size of a literate population. Then that literate population finds new ways to act together, using the new social capabilities that the new medium makes possible. The US Defense Department's computer research network became the Net, and the Net evolved into the Web. SMS was created by engineers in Europe, appropriated by teenage girls in Asia, and used as a political organizing tool by other people in other parts of the world. In the current era, just as the decades following the invention of the printing press, literacy is racing to catch up with the raw output of new forms of information, and social norms and institutions are following at a slower pace. The technologies available to billions of people today are far more powerful than the Gutenberg press, but the literacies are more complicated, and the pace of change is much faster this time. It isn't clear at present whether a sufficient number of people will gain a sufficient degree of literacy in digital media to manifest collective creations as powerful as science and democracy were in the Gutenberg era..

The power of the alphabet was confined to tiny elites in service of rulers for thousands of years. McLuhan claimed that the alphabet made the Roman Empire possible. When the Gutenberg press multiplied the ability to distribute text in the late 16th century, the technology interacted with social and cultural forces such as the Protestant reformation and the growing power of the merchant class to vastly expand literacy in Europe. It was the newly literate populations, armed with the ability to encode and decode alphabetic knowledge and the ability to use that skill in concert with others, invented parliamentary democracy, science as a collective process, capitalism as the dominant form of economic production. In the present period transformation, during the early years of the 21st century, it's time to shift our attention from the press to the literacy, from the Net to network know-how.

I've identified five essential literacies that anybody with a smartphone, a laptop or desktop PC, or an Internet account would do well to master. I don't include scientific literacy, although it is fundamental to the benefits of technology and is under attack today, because it's a Gutenberg-era literacy, not a post-Web literacy. The literacies I consider to be essential today are attention, participation, collaboration, informed consumption, and network savvy. None of these skills are rocket science, or even algebra, but they involve new cognitive routines, media habits, social practices.

Attention literacy is what we'll get when the students surfing the net during lectures, the people in a business meeting who are looking at their blackberries instead of each other, the texting driver next to you in traffic, learn how to use their attention in an always-on environment. When is multitasking appropriate, when is focused, one-pointed attention the cognitive tool of choice, how do we balance need to know and information overload?

These are questions about the use of technology-mediated communications, but they are questions about how technology users use their own minds. We're just beginning to learn how to do this.

Participation literacy is about knowing how to use RSS to track an issue, a blog to advocate a position about that issue, a wiki to organize collective action around that issue. From education to politics, the era of the passive, read-only consumer of culture that is produced and broadcast to the masses by a tiny elite has suddenly shifted to the era of active participants who create as well as consume digital media. Participation is about personal empowerment in a networked world, but it's also about citizenship – the person who has used a blog or commented on a blog about policy issues feels like someone who helps create democracy, not just someone who is ruled by it.

Crap detection is what Ernest Hemingway called the essential skill of deciding for yourself whether what you've read in the newspaper, seen on television, Googled on the web is accurate or not. Today, the answer to any question can be plucked out of the air, but unlike the print era, the responsibility for determining the accuracy of the answer is not with the publisher of texts, but with the consumer of information. Again, this is about enabling individuals to find their way through the misinfo and disinfo, but it's also about improving the quality of the commons – the more people who know how to debunk scurrilous political rumors and know how to determine the credibility of the information on a web page, the more valuable the web will be for everyone. We can't and shouldn't control what people put online. We can only educate those who find, use, and pass along what they find online.

Collaboration literacy is what enables thousands of volunteers around the world to create Wikipedia, a free encyclopedia, or Linux, the free software that has challenged commercial market leaders, or to organize a 12,000 volunteers to search half a million photographs in a matter of hours to search for a missing computer scientist's boat at sea. The set of communication and computing tools, freely available on the Web, popularly known as "Web 2.0" have enabled billions of people to convene communities, collectively create knowledge or software or organize disaster relief or political demonstrations. Of the people who have access to the same set of tools, so far only a relatively small portion know the skills of growing communities and catalyzing collective action. Virtual communities, like all other forms of community, are not automatically healthy and valuable ways for people to spend their time. Smart mobs are not necessarily wise mobs. In regard to mass collaboration, what people know, and how many of them know about collaboration capabilities, is another critical uncertainty.

Manuel Castells has pointed out that "network society" is a better description of today's world than "information society." We are humans in large part because of our social capabilities, and social networks are as old as humans, but until recently the size, scope, complexity of our social networks were limited. Technological communication networks, from the telegraph to Twitter, have vastly expanded our capabilities. But again, knowledge of best practices (and pitfalls) lags behind the technology. Network literacy encompasses a wide range of skills and knowledge, from how (and why) to use Facebook

privacy protections to the best way to grow a personal learning network to the usefulness of weak ties in one's portfolio of social connections.

Taken together, these literacy's constitute the unwritten user's manual for the remarkably powerful set of digital media and communication networks that are available to a significant portion of the human race. Whether these technological innovations end up as benefits or pitfalls depends to a large degree on how many people gain access to this knowledge.

Reference URLs:

Howard Rheingold 6 minute video interview on 21st century literacies:

<http://vimeo.com/5659525>

Howard Rheingold 40 minute video of a talk at Reboot Britain, July 2009, on 21st century literacies: <http://blip.tv/file/2373937>

Michael Wesch 4 ½ minute video, The Machine Is Us/ing Us, 2007

http://www.youtube.com/watch?v=NLIgopyXT_g

Michael Wesch 60 minute video, A Portal To Media Literacy:

<http://www.youtube.com/watch?v=J4yApagnr0s>

Did you know? Video about social media:

<http://www.youtube.com/watch?v=6ILQrUrEWe8>

Howard Rheingold's social media issues course at Stanford

<http://socialmediaclassroom.com/host/vircom>

Howard Rheingold's social media course as a concept map

<http://cmapspublic3.ihmc.us/rid=1GG4QC6TN-TFDMX0-CXH/Virtual%20Community%20and%20Social%20Media.cmap>

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