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A Radical Reconsideration of Digital Literacy

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A quick glance around my office brings in view various recent books, reports, and toolkits on libraries, for instance: *Developing Community-Led Public Libraries: Evidence from the UK and Canada*, by John Pateman and Ken Williment; *Transforming Libraries, Building Communities*, by Julie Biando Edwards, Melissa S. Robinson, and Kelley Rae Unger; *Public Libraries and Resilient Cities*, edited by Michael Dudley; the “Community-Led Libraries Toolkit”; and the “Libraries Transforming Communities Toolkit”. Cutting across these resources is a clear statement that libraries can play a leadership role in fostering local, contextualized human and community development. Libraries serve as keystone institutions by harnessing new approaches for participatory, inclusive, community-led development of programs, services, and resources while also continuing to leverage traditional skills of library and information workers.

Supporting the transformation of information into knowledge for human flourishing within an “information age” and a “knowledge economy” especially points out the important role library and information workers have in advancing people’s digital literacy skills. And indeed, we are regularly at the front lines of digital literacy training, often in response to the digital divide and in support of workforce training. More recently, this may also include Makerspace and STEAM (Science, Technology, Engineering, Arts, and Math) programming. Many of these emerging initiatives are models for youth- and interest-driven programs that also advance 21st century digital literacy skills.

But is it possible that we approach digital technology and literacy training and programming through dominant paradigms that keep invisible the various ways our digital technology and media are controlled and mediated so as to privilege a few over the many?

Is it possible that that in our very efforts to “bridge the digital divide” and build “21st century digital literacy skills” that we are actually further deconstructing civil society and civic engagement, and instead furthering magical thinking about technology, a belief in the supremacy of the technocrat, and the centrality of market forces?

I joined the staff at the Graduate School of Library and Information Science, University of Illinois, in 1995 to work with the Prairienet Community Network initiative. It served as the first Internet Service Provider to our community, but the broader objective was to explore how democratic problem solving might change if a community gained access to, and the skills to use and contribute to, the Internet. Shortly after, I also began teaching networking and information systems courses for Masters in Library and Information Science candidates. I made extensive use of service projects, community inquiry, and engaged scholarship to bring together the school and community to advance community goals (Montegue, et. al., 2009; Wolske, 2012). The above two critical questions may seem alarmist. But an ethnographic study of my course “Introduction to Networked Information Systems” conducted by Junghyun An (2008) found that without greater criticality¹, the answer to the two questions above very well ended up being yes, it is possible and indeed likely.

¹ See Nicholas C. Burbules and Rupert Berk’s 1999 essay “Critical Thinking and Critical Pedagogy: Relations, Differences, and Limits” for an excellent comparison of formal practices of two forms of criticality. The approach outlined in the current paper is in more sympathy with Critical Pedagogy, especially as outlined by Paulo Freire within the context of adult literacy. But the later conclusion of Burbules and Berk regarding criticality as practice depending on difference also resonates strongly with the approach for digital literacy training outlined in the current paper.

This article focuses specifically on the need for a radical reconsideration of digital technology and digital literacy if we are to challenge the dominant paradigms that privilege a few over the many and to instead work towards progressive goals of a more just society.

The Historical Linking of the Digital Realm and Neoliberalism

Daniel Green's excellent 2016 article "Discovering the Divide: Technology and Poverty in the New Economy" brings to light the neoliberal economic agenda that served as the underlying framing of the digital divide and resulting policies directed towards eliminating that divide. The first of the National Telecommunications and Information Administration (NTIA) "Falling through the Net" reports came out in 1995, early in the Clinton Administration and concurrent with efforts by the administration to significantly reform welfare. Decreased emphasis was put on challenging the structures that create poverty. Instead, greater emphasis was put on short-term safety net support combined with workforce skills development. As a result, a healthy citizenry was redefined as "a bundle of human capitals brought to market by information technology" and digital literacy training became a limited investment in "workforce-oriented technology provision and training" (Greene, 2016). Ultimately, poverty was no longer situated as a societal problem but a problem of individual choices. To that end, this further justified expanded use of digital technologies for monitoring and policing of those in economic poverty (Greene, 2016; Eubanks, 2011; Eubanks, 2007).

In 1994, the think tank Progress and Freedom Foundation released the publication "Cyberspace and the American Dream: A Magna Carta for the Knowledge Age" written by Ester Dyson, George Gilder, George Keyworth, and Alvin Toffler that enunciated themes of digital utopianism, radical individualism, anti-government, pro-business libertarianism, and laissez-faire economics. A group comprised of theorists, philosophers, and

journalists brought forward the term cyberlibertarianism (Winner, 1997; Golumbia, 2013) to describe this unique blend of themes that was prominent in Silicon Valley and digital culture more generally at the time, and continues to dominate today. As but one example, consider how we speak of the corporate Twitter Revolution to explain the civil activism in the Middle East from 2009-2011, rather than considering the deep intellectual and political work people did to lead these revolutions, certainly in part by using emerging tools like Twitter.

For me, this is no more strongly evidenced than in Microsoft's Empowerment commercial that first aired during the 2014 U.S. Super Bowl, an event often known as much and more for its airing of major new commercials as for the actual American football played. The Microsoft commercial opens asking the question "What is technology? What can it do for us?" It then goes on to answer that question through images of amazing human feats accompanied with voice and text overlays making statements such as: "Technology has the power to unite us," and "Technology has taken us places we've only dreamed," and the conclusion that "It gives hope to the hopeless, and it has given voice to the voiceless." It's as if the people celebrating the moon landing, the people living on opposite ends of the world, and the double amputee learning to walk, each of whom are seen in the commercial, would have been left sitting in bewilderment were it not for a technology coming forward of its own agency, through the guiding hands of the technocrat and their corporate patrons, to help us. This is not to pick on Microsoft in particular, but to rather illustrate what I believe is the dominant narrative for all of us regarding technology, and especially digital technology – technology has agency to fix human problems.

A Radical Understanding of Technology

Radical – of or relating to the root of something (Miriam-Webster.com)

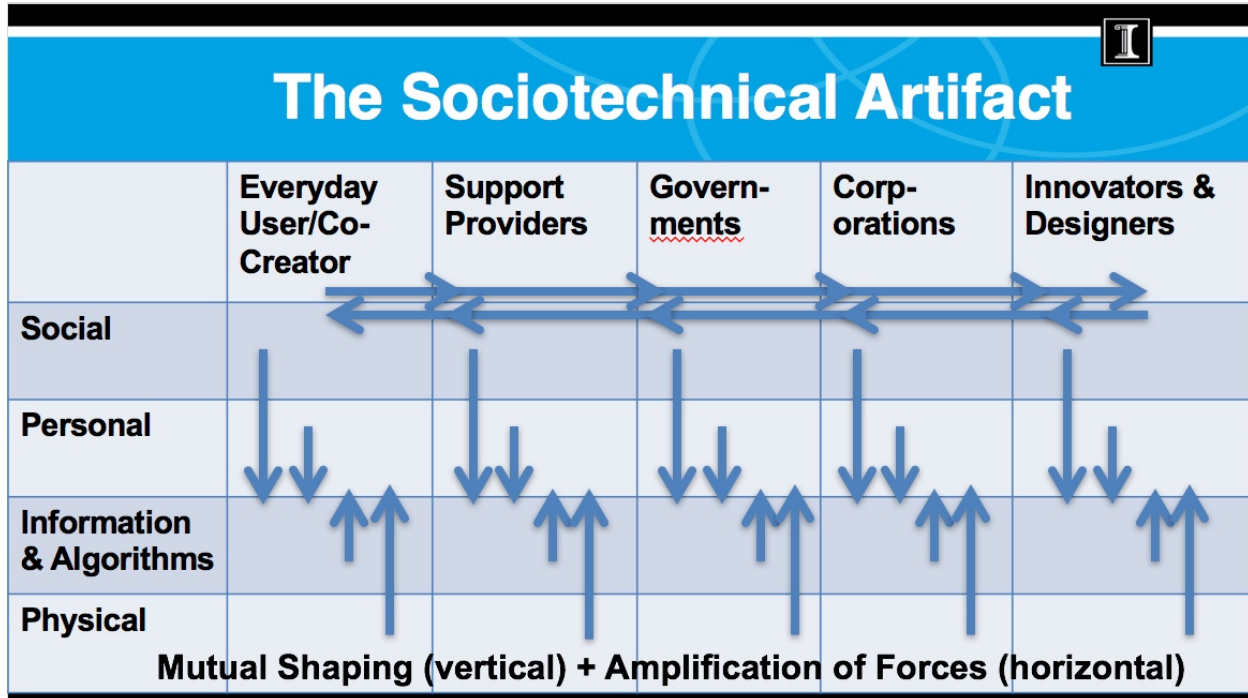
Early in the development of digital technologies, engineers working on the physical infrastructure and computer scientists working on the software algorithms realized they could accomplish more if they coordinated their efforts. Later, behavioral scientists were brought into the mix to advance a more user-centered design of the technical aspects (Whitworth, 2009).

Today, there's a growing realization that our digital technologies are actually a seamless, indivisible combination of artifact, people, organizations, policies, economics, histories, cultures, and knowledge – they are sociotechnical products (Wajcman, 2010). As a result, the reliable, anticipatable relationship between user input and system's output is complicated by the continuous evolution of experience, knowledge, history, culture, economics, and policies of users and society. The social characteristics cannot be readily planned for or controlled, especially as the sociotechnical products are continuously co-created by everyday users to fit the ever-changing contexts and knowledge of the users and their communities (Bruce, et. al, 2009; Fischer & Herrmann, 2011). As such, the reductionist and positivist approach of the engineer and computer scientist must be complemented by, and live in continuous tension with, an interpretive approach of the social scientists, and *even more importantly, with the social expertise of community members.*

In his thought-provoking 2015 book *Geek Heresy*, Kentaro Toyama notes that technology does not itself have agency to transform us and the world around us. Rather, humans use technology to amplify our individual and group forces to transform our world. This is primarily framed from the perspective of the everyday user. However, if we bring criticality together with a sociotechnical perspective (Rhinesmith & Wolske, 2014), we also need to reflect on the human forces amplified at each level of a product's life cycle. We need to ask in what ways the forces of engineers, computer scientists, and garage inventors; of the president, CEO, board, and shareholders of corporations; of the marketers and salespeople; of

government legislators and administrators; of educators and social service agencies; of individuals and groups as co-creators; and of the many others in the product life cycle might be amplified in ways that are consistent with and counter to the values and goals of those using the sociotechnical product at each stage of the artifact's lifecycle to accomplish a task.

Mutual shaping of the sociotechnical product, hardware and software that is shaped by the social and personal preferences of stakeholders who themselves are shaped by the products that they use, happening at every stage of a sociotechnical artifact's lifecycle. For instance, the social context and personal preferences and biases of innovators and designers of a product shape how they create the software and hardware. But so, too, the socially shaped sociotechnical products that they use to perform their creative works shape how they do their work. Move through the lifecycle of an artifact, and we see CEO's, salespeople, legislators, educators, and many others both shaping the formation of that artifact through their own social lenses, personal preferences, and biases, and also being shaped by the tools they are using to support the formation of the artifact. In this way, also, the human forces of the people at each stage of the product's lifecycle influence people at the other stages through their social influences *to the extent that they have power and agency within that social system.*



A radical understanding of digital technologies, that is, an understanding at a root level, brings to light the many ways cultural, economic, political, historical, and other social factors shape software and hardware, thereby shaping social systems. It lets us see how oppressive power relationships can become reified through use of some digital technologies more than others when the social systems shaping a specific sociotechnical product are on balance oppressive, even if invisible. We can see how historic neoliberal agendas can be brought forward over the course of decades through our use of digital technologies, even when those using them do not share such neoliberal values.

But at the same time, through this radical understanding of digital technologies we might begin to see that if we expand our approach to digital literacy so as to demystify not only the hardware and software layers of a sociotechnical product, but also the personal and social, we can foster greater agency to challenge oppressive forces and champion a more just society. Within a critical sociotechnical perspective, selecting appropriate technology becomes more than deciding when to use one

type of digital technology versus another (or whether to forego use of digital technologies altogether). It is to further recognize which specific sociotechnical product – which embedding of the many different social and technical influences across the lifecycle of that product – best aligns with the values, goals, cultures, contexts, and capabilities of those using that product to amplify their own human forces. This may seem an overly complex, or perhaps an impossible, task. And indeed, it does provide a significant set of challenges.

On the other hand, there can be a significant negative social impact if we do not shift from a reductionist understanding of technology as a neutral combination of hardware and software nuts and bolts, towards a critical sociotechnical understanding of technology. Individuals and groups may fail to recognize that there is a misalignment between the social forces that shaped the sociotechnical product and their own preferences, history, culture, capabilities, and context. As a result, we may have reinforced our personal doubts regarding their ability to effectively work with technology. We may give up and instead await “experts”, or may unquestioningly follow the lead of market hype that a new model or new technology will resolve our problems and take us “places we’ve only dreamed” (Microsoft, 2014). Digital literacy training from a reductionist perspective of technology may thereby serve to reduce, not strengthen, important competencies needed to be fully digitally literate.

Over the course of the last two decades, I believe one of the lasting impacts of the neoliberal foundations of cyberlibertarianism and of digital divide concept and policy is this exact negative social impact decreasing our socio-emotional skills with digital technology. I have found this negative impact applies equally to those who have never directly used digital technologies, and to library and information workers who are daily users of technology.

As a minor example of a social misalignment, consider the manila folder and floppy disk icons used with some versions of software like the Microsoft Office suite. This metaphor arose naturally within a company focused on supporting office workers (company business model influencing software development). However, in my physical office, the manila folder is something I pull out when I have a set of documents I'm done working with and plan to archive. Thus, the manila folder icon to me means save. On the other hand, I spent many years using the floppy disk as a means to exchange files between computers. Thus, to me the floppy disk icon means open. As a result, when I use office software that incorporates these icons, I periodically confuse the two and click the manila folder icon when I want to save, and the floppy disk icon when I want to open (personal experience coming into conflict with developer and corporate experience).

I can laugh over this when I make the mistake because I have situated this misalignment within the context of differing histories, cultures, and thought processes, and because in the grand scheme of things it's rather minor. And I can laugh because I have confidence in my technology skills. But this is not the case for everyone, and indeed for many, such experiences result in doubt, not laughter. Move to an international context, and we can begin to critically reflect on how a Western economic, cultural, and historical framework embedded within a range of sociotechnical products can function as a neo-colonizing influence elsewhere.

Overcoming this neoliberal agenda and reductionist perspective requires the fostering of key socio-emotional skills with digital technology. In so doing, we also advance our ability to effectively select and appropriate sociotechnical products in ways that better amplify our individual and group forces to achieve goals for human and community development. In the next section, I would like to propose community inquiry, popular

education, and deliberative dialogue as foundational in such a social-forward approach to digital literacy.

Community Inquiry as the Basis for Digital Literacy

Literacy is a set of competencies and knowledge within a certain domain. Digital literacy, then, is literacy within the realm of digital information and communication technologies. Summarizing a variety of definitions regarding digital literacy and related computational thinking², the set of competencies include:

Technical skills – the ability to appropriately select and effectively use a range of technologies;

Information skills – the ability to seek, evaluate, interpret and apply relevant and trustworthy information across multiple media;

Cognitive skills – the ability to logically analyze and organize problems in ways that allow use of digital and other tools to help solve them, and to generalize new processes to other problems;

Socio-emotional skills – the ability to communicate and collaborate with others, along with the personal confidence, persistence, and tolerance, in order to tackle complex, ambiguous, and open-ended problems; and

² Key resources defining digital literacy and computational thinking used in this summary include:

- Connecting the Digital Dots: Literacy of the 21st Century, by Barbara R. Jones-Kavalier and, Suzanne L. Flannigan.
<http://er.educause.edu/articles/2006/1/connecting-the-digital-dots-literacy-of-the-21st-century>
- ALA Digital Literacy Definition.
<http://connect.ala.org/node/181197#sthash.TdJ13wxa.dpuf>
- Computational Thinking Definition.
<http://csta.acm.org/Curriculum/sub/CurrFiles/CompThinkingFlyer.pdf>

Application skills – the ability to integrate the above skills into our everyday experiences in order to advance our professional, personal, and civic interests and responsibilities

Wrapping around each of these five bullets I would add a radical criticality and sociotechnical perspective brought forward as part of community-centered deliberative dialogue processes – processes that each of the books, reports, and toolkits mentioned in the first paragraph of this paper highlight as core to the effective practice of library and information workers within the keystone institution of the library.

Paulo Freire used a popular education approach to adult literacy to link the learning of words, for instance, *tijolo* (Portuguese for brick), with generative themes regarding oppression in society, for instance, the way individuals participating in the adult literacy class are forced into low-wage jobs making bricks so that oppressors can build physical walls of exclusion. By stringing together the syllabus of words, for instance, *ti-jo-lo-ti-jo-lo-ti-jo-lo-ti-jo-lo*, participants come to see the social construct of words, and the opportunity for constructing new words. Thus, adult literacy also becomes a work of conscientization, of seeing and then working to bring about a new reality. How can we create similar popular education approaches to digital literacy training?

In their paper “On Communities, Justice, and Libraries”, Buschman and Warner posit a Deweyan conceptualization of community as “cooperative coping” – the fostering of deliberation and exchange of ideas to support decision-making – for adoption by libraries. This aligns closely with community inquiry as outlined by Bertram “Chip” Bruce – an open-ended, democratic, participatory engagement connected to people’s values, history, and lived experiences and conducted of, for, and by community. I would argue this should be the basis for digital literacy training.

What has this looked like in the work of my collaborators and me (Digital Literacy for ALL Learners, n.d.)?

We have been exploring a social-forward approach to digital literacy training. We learn best when doing things that matter to us. Rather than starting with skill shares, we often begin by seeking to understand the ultimate creative works participants are seeking to accomplish. What opportunity or problem are participants trying to address? What goals, values, histories, and context are motivating these works? What existing tools are currently being used, and what are the social ramifications for augmenting or replacing them? This is the beginning of a community inquiry into the skills and technologies that might more effectively help amplify the human forces at work addressing the community-defined creative work.

We incorporate the various aspects of digital literacy as infill where need is identified. This is the heart of all project-based learning — skills development is a response to project selection and initiation rather than as standalone training. While we often incorporate off-the-self technical and information skills curricula, we typically add our own exercises, discussion starters, and critical reflection questions to more effectively: a) advance cognitive and socio-emotional skills development and a critical sociotechnical perspective; and, b) bridge skills development with the projects that initiated the digital literacy infill.

We try to include exercises to explore all dimensions of a sociotechnical product. For instance, in a workshop on using a mobile phone within a project, exercises might be included that have participants research the mission statements of different handset vendors and cell network providers, and map these to the different features of the hardware, software, and cell packages as a way to consider how some phone/cell network combinations might work better than others for a project.

We regularly intersperse discussion and critical reflection with hands-on activities to bring forward participants human and social expertise to digital literacy training. No one knows better the goals, values, and context motivating digital technology adoption than those taking the

training to accomplish a creative work. Further, as instructors we may not be aware of the way a sociotechnical product and the broader supporting infrastructure – an infrastructure that may work well for us – may be misaligned with the goals, values, preferences, history, culture, capabilities, and contexts of participants. Such misalignment at times privileges some over others in ways that create injustices. As such, our willingness to transition from digital literacy instructor to learner itself can be an act of justice, and can lead to further justice-oriented actions.

Importantly, such an approach does not separate out digital literacy learners for special remedial education. Rather, it brings together people with many different types of expertise into deliberative dialogue and community inquiry. As noted by Iris Marion Young, group difference becomes a necessary resource for such dialogue and inquiry to flourish in at least three ways:

“Plurality of perspectives motivates claimants to express their proposals as appeals to justice rather than expressions of mere self-interest or preference.”

“Confrontation with different perspectives, interests, and cultural meanings teaches individuals the partiality of their own, and reveals to them their own experience as perspectival.”

“Expressing, questioning, and challenging differently situated knowledge adds to social knowledge.”

I would argue that the real potential for learning labs, innovations spaces, and Makerspaces in libraries will be realized precisely to the extent that they are able to transcend digital literacy training for its own sake to become hubs for group dialogue and community inquiry across difference. This approach does not seek to minimize or negate the value of technical skills development, or for that matter workforce development, but rather to situate these within the broader human and community development goals as defined by the experts on the community context, the

community members themselves. Further, it situates technical skills development within the broader information, cognitive, socio-emotional, and application skills of a more comprehensive digital literacy conceptualization and practice as outlined above.

As a concrete example, here's an outline of a session on hardware that was the first of a five-part workshop (Wolske, n.d.). It was offered to parents of students attending a local elementary school whose constituents were primarily from low socio-economic households. The school's motto, "Technology and Literacy for the Community", inspired them to look for creative ways to further engage parents as collaborators in their children's education, knowing that a significant number of households did not have a computer at home, and some parents had little experience using computers. At the end of the five sessions, parents had refurbished their own computer that they took home while also developing a range of digital literacy skills:

Goals: Begin drawing out each participant's community expertise by highlighting his or her everyday innovative acts.

Foster the formation of a community of inquiry comprised of parents, teachers, and students focused on the possible roles of digital technology in student learning.

Advance digital literacy skills by generalizing their everyday expertise to the digital realm.

Icebreaker: As you enter, please take a moment to draw a picture of an innovator innovating.

Introduce yourself and describe one way you've taken something you have and used it in a way it wasn't meant to be used to solve a problem. Then tell us about the picture you drew [most people draw a white male working alone doing something they deem innovative].

Discussion: How do the pictures we each drew compare to our descriptions of ways that we've innovatively repurposed something we have?

Hands-on Activity: Disassemble a computer, highlighting the main parts as we go. Highlight upgrade options and maintenance needs. Imagine the flow of a keystroke as it travels from the keyboard input port to controller to CPU to memory/storage and back from the CPU to the video controller and out to the video display. Review other disassembled devices, including a laptop, a tablet, and a smartphone. Note that the flow of the keystroke passes through the same general parts.

Discussion: What makes a desktop computer different from a laptop computer, a tablet or a smartphone if they use the same general parts?

What values and goals may have gone into the different ways the parts are put together?

How might choosing one format over another benefit certain values and goals over others? Which is the best device for education? How might you redesign the device if you could to better fit your values, goals, and context?

What is it? [Place a smartphone on the table, turned off. As suggestions come in, challenge participants to think expansively across different contexts to note how they have themselves been co-creators of the smartphone. Also challenge them to consider what it can't be because of policy or economic restrictions.]

During a later session of the five-part workshop, we installed educational software called eToys. The graphical display of the software didn't work properly on some computers but worked fine on others. Without

prompting, the parents, some of whom had rarely if ever directly worked with computers, reflected back on the keystroke exercise from day one and began to put forward ideas of what might be failing. They were able to correctly diagnosing that the problem might be related to the CPU's ability to talk to the video controller, even though they couldn't specifically use those words, but rather referred to the analogy "traffic cop" used to describe the keystroke flow on day one. And they found three different solutions for resolving the problem based on that diagnosis, again even though they couldn't specifically identify the technical phrases to describe their solution.

In a discussion arising from a different workshop that included both parents and teachers and that used a similar outline, an African-American parent noted the frustration they feel when teachers question their decision to purchase a smartphone rather than a laptop. They went on to note how as a parent of color, they need to teach their children to call a relative or close friend whenever a police officer seems to be looking at them closely, and to then put their smartphone in a pocket with the connection open in case a negative encounter develops. As such, the smartphone, while an inferior device to the laptop in some ways for educational purposes, has a unique lifesaving property, the value of which trumps other considerations if the purchase of only one device is possible.

These two examples highlight that when we demystify the social <-> technical aspects of our digital technologies, we both increase the agency of learners and open up the sharing of each participant's expertise among the group as part of an emerging community inquiry. While I've been actively working to build better digital literacy training for over a decade, I still feel as if I've only scratched the surface. This continues to be a new world of discovery, especially as every digital literacy workshop becomes a co-learning space to further explore new realities regarding how sociotechnical projects are shaped by, and also shape, us and the world

around us by amplifying a wide range of human forces. To this end, our Digital Innovation Leadership Project (n.d.) has been working to bring together the demystifying technology approach to digital literacy outlined in this paper with collective leadership training to further create possibilities for situating digital literacy within broader social justice and community development objectives.

In conclusion, whether as part of pre-professional and professional development of library and information workers, or as part of programming offered by these professionals, a radical reconsideration of digital literacy is essential if we are to effectively use sociotechnical products to amplify human forces to advance human and community development for human flourishing. This social-forward approach to digital literacy training doesn't negate learning about the nuts and bolts of the hardware and software, but situates such learning within the individual and group goals and values of participants. This has led to the following key takeaways:

We need to recognize the many ways the social, cultural, historical, economic, and political values and practices of stakeholders at each point in a sociotechnical product's lifecycle tend to become embedded within that product.

There are exclusionary social structures, some of which we actively – even if unintentionally – reinforce through our choices and actions regarding technology.

Digital literacy without a critical and sociotechnical perspective is at risk of fostering magical thinking and technological utopianism.

Therefore, those of us with technology expertise, while we may enter into community engagement as instructors, need to be willing learners if we are to understand the exclusionary social structures embedded within sociotechnical artifacts. On the other hand, the digitally excluded and

participants from the margins of society, while they may enter into digital literacy training as learners, bring essential sociotechnical expertise and teaching to each of our digital literacy training activities. Group difference is an essential deliberative resource within such a social-forward approach to digital literacy programming and services. In taking such a transformative approach, we library and information workers take a step away from the dominant neoliberal paradigm of digital technologies and digital literacies and instead take a step towards amplifying human forces working towards a more just society.

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