Distraction Addiction : What Language Educators Ought to Know about Digital Media's Effects on Human Cognition and Communication( )

Distraction Addiction: What Language Educators Ought to Know about Digital Media's Effects on Human Cognition and Communication

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Abstract

This paper begins with a brief look at the reasons behind the meteoric rise in popularity of our digital tools, then investigates the prevalent attitudes of Japan-based ELT educators regarding the implementation of these tools in their classrooms, and finally provides an overview of the critique that is emerging in our wider society regarding the rush to all things digital. First, the popularity of the tools is explained in terms of the connectivity, multiplicity, and interactivity that they deliver. In the subsequent section, ELT in Japan is found to currently have an overwhelmingly positive disposition toward the digitization of language education to the point that a prudent critical balance may be lacking. Finally, to help restore a balanced perspective, the possibly negative consequences that digital tools may be having on human productivity, interior cognitive depth, and social skills are explored in greater depth, and a brief discussion about what this critique might imply for the role of technology in our ELT classrooms is offered.
Key Words: *digital ubiquity, technology in ELT, multitasking myth, digital dependency critique*

Introduction

Digital technology in education has fully arrived, and there is no turning back. In a sense, academia is simply mirroring the trend in our wider society in which digital tools, especially handheld ones, are becoming ever more ubiquitous. The total number of mobile phones at the beginning of the century was 500 million (Powers, 2010). Now, barely more than a decade later, the number of mobile devices connected to networks on our planet has already reached 5 billion, and industry forecasts for the future range as high as 50 billion by 2020 (Keen, 2012). As recently as a decade ago, there was still a degree of resistance from some educational institutions, especially due to the prohibitive costs involved in adding so many computers and peripheral equipment to facilities. Teachers also sometimes resisted, especially due to the steeper learning curves and more rigid

systems associated with the technology available up until just a few years ago. But in a remarkably short time, our digital tools have become more mobile, simpler to use, and vastly cheaper to the point that it seems as if most resistance has been overcome as schools and teachers now race to digitize the learning environments they provide.

As more and more teachers become adept at using technology themselves, the enthusiasm to incorporate it into lessons is almost palpable. At least this appears to be the case in the corner of academia that I am most familiar with: the world of English language teaching (ELT) in Japan. My impression is that the tide has turned greatly over the course of the last decade or so, and here in Japan the adoption of digital technology in language curricula is exuberantly preceding full speed ahead. While it is inspiring to witness earnest and creative responses to this major shift in our society's preferred media, my fear is that, while sensible adoption is of course necessary, over-exuberance often entails a lack of critical perspective. As Powers (2010) points out, "when a crowd adopts a point of view en masse, all critical thinking effectively stops" (p. 49). And with the rapid advancements in the speed and ease of communications that our digital tools have made possible, it is now easier than ever for opinions to coalesce and mass movements to spread. Terms such as *hivemind* and *groupthink*[1] are now widely used to describe this increasingly noticeable phenomenon of crowd dynamics brought about by our digital revolution.

The second section of this paper presents an attempt to probe a bit deeper to see if my impression of apparent groupthink in ELT when it comes to digital technology is warranted. After that, the paper pivots into an overview of some of the more scientifically-grounded and thought-provoking critiques that are gaining traction in other fields, and that may help us make more fully informed decisions in ELT as we ponder the best ways to incorporate technology into our classrooms. Before looking specifically at our attitudes about digital media in ELT, however, a brief review of the essential features of these news tools that have caused them to soar so rapidly in popularity is necessary.

1. Newly Indispensible Tools

For those of us currently participating in the typical public structures of modern society, such as work and schooling, it is becoming increasingly difficult to imagine accomplishing our daily tasks without the aid of digital technology. Most

students today are young enough to not have memories of life without computers in homes and schools, and so these digital natives take them and their recent mobile manifestations for granted. Most digital immigrants, those of us who can still recollect how society functioned before the advent and rapid spread of digital computing and communications tools, would likely credit these remarkable devices with greatly enhancing the convenience and speed with which we conduct our daily tasks. But what precisely has become more convenient? And what exactly has sped up? These questions lead us to the characteristics of our digital tools that are emerging as most salient: namely, connectivity, multiplicity, and interactivity.

1.1 Connectivity

The first few generations of computers in the previous century were primarily machines for calculation, but we have clearly moved far beyond that. The connectivity provided by these tools is emerging as the trait we now rely on most (Turkle, 2011; Keen, 2012). Hypertext has been revolutionary in its ability to allow us to link pieces of online information together according to whatever sort of associative rubric we fancy. Email, texting, video chat applications, the Internet, and the myriad of other networked tools in our computers have greatly increased the ease and frequency of our connections to people and information physically removed from us.

The explosive growth of smartphones and other truly mobile devices over the last five years or so has intensified this connectivity. Previously, our new digital connectivity grew within an important physical boundary: typically we were fully connected only when we sat in front of our desktop computers. When we walked away from that setting, we walked away from the connection and re-entered "real time."[2] Now, many of us are connected wherever we go. Certainly some people, whether by choice or for economic reasons, still do not participate in this perpetual connectedness, but the cultural momentum is emphatically in the direction of increasing connections.

Ubiquitous social connectivity is the technology topic du jour, and major information technology corporations are stumbling over each other in the race to monopolize this aspect of the digital revolution. Social network sites like Facebook, Twitter, and LinkedIn are experiencing phenomenal growth (Keen, 2012; Pariser, 2011), and Google is doing its best to muscle in on the action. In

the parlance of Silicon Valley, Web 1.0 was all about making existent information readily available via our digital tools. Web 2.0, which was undergoing booming growth just a few years ago and is still spreading, has been about gathering a new sort of information: user-generated data. Google, Amazon.com, Wikipedia, and auction sites like eBay are among the big Web 2.0 winners because they have provided platforms for users to contribute content, and have successfully harnessed that content in ways that others find useful (O'Reilly, 2011). Now, technologists such as LinkedIn founder Reid Hoffman (cited in Keen, 2012) suggest we have embarked on the road to Web 3.0, and this version is all about personalizing and personifying the Web experience via intensifying the role of social networks and tracking user habits. The major currency in the 3.0 incarnation of the Web is personal data: information about us and provided by us whenever we use the Internet. The privacy concerns that this development raises will be addressed later in this paper, but at this point it suffices to say that connectivity features are intensifying, and fueling this change is the commodification of the data which records the patterns and details of our many connections.

1.2 Multiplicity

Multiplicity is another increasingly salient feature of our digital machines. At this moment in history, the technological innovation ushering in our massive shift from print-based to digital media is proceeding so rapidly that it is easy to lose sight of the overall arc of change due to the blur of constant product updates. Taking a step back, though, we see that it is the convergence of functions into single tools that really stands out. The term *smartphone*, for instance, is almost becoming a misnomer because the telephoning function on these devices is being used less and less (Turkle, 2011) since the tool delivers so many other useful functions as well. If you spend much time in public spaces, think of all the people you see in a typical day using their smartphones. How many of them are engaged in a phone call? Chances are the vast majority of them are texting, engrossed in games, flipping through musical options, or surfing the Web instead.

So, these digital tools that we stare at more and more frequently each day are providing multiple functions. They are also juxtaposing a multiplicity of cognitive modes. That is to say, our conceptual boundaries between different channels of thought and perception that used to be more cut and dry are increasingly dissolving as digital applications burst through limitations imposed by pre-digital

media. For example, distinctions between written and spoken modes of language (Baron, 2008), and between the public and private construction of our identities (Turkle, 2011) are no longer as clearly defined as they used to be. Similarly, as our written words migrate from the relative austerity of the printed page to their new digital home on our screens, they are becoming embedded in an increasingly complex and demanding visual and audio space in which they have to vie for our attention. Accordingly, the definition of "reading" itself is being revisited and tentatively reaffirmed or revised by more and more educational psychologists, neurocognitive scientists, and philosophers as they grapple with the consequences of our new medium (Wolf, 2007). Carr (2011) reviews the work of several reading researchers and finds that they are more apt to label what we do on the Web as *skimming*, *decoding*, or as a research team at University College London calls it, *power browsing*.

To multiplicity of modes and functions, we must also add task multiplicity. The term *multitasking*, though relatively new, is now firmly ensconced in our lexicon. When it first appeared, it was strictly a technical term referring to the parallel processing capabilities of computers. Then, beginning in the 1990s, it started to be used to describe what was thought to be a newly evident human skill: the apparent ability to attend to various tasks simultaneously with the help of digital technologies (Rosen, 2008). Nowadays, technology enthusiasts tend to prominently mention multitasking when attempting to explain how exactly computers are improving our lives (Carr, 2011). Anyone who uses digital tools on a regular basis is probably already so used to multitasking that he or she is hardly aware of doing so. Multitasking on a computer typically involves having more than one application window open and stacked on the screen (e.g., email, a Web browser with multiple tabs, a word processing application, and a music or video player), and the user shifts back and forth among them as the need or impulse arises. We get so used to the constant shifting, that it may begin to *seem* as if we are completing various tasks simultaneously. But are humans really capable of true multitasking, either in terms of predisposed cognitive tendencies or trained acquisition? Yes, some of us can drink coffee and drive a car at the same time, and some of us can apparently skim through email messages while carrying on a conversation with a person next to us, but are we performing either task optimally when we do so? This critical question will be explored in greater depth below.

1.3 Interactivity

What else stands out as truly "new" in our digital tools? Certainly interactivity is another remarkably salient feature. The digitally-mediated, person-to-person interactivity of increased connectivity has already been mentioned, but interactivity also refers to something much more elemental and pervasive in these machines. The fact that we now have tools that are so obviously responsive to the slightest stimulus we give them is an incredible breakthrough in the history of technology. Simply tapping a screen or clicking a mouse can produce a desired response almost immediately. This is addictive. Most other objects and entities in our environments are not so easily manipulated. Who can blame us for desiring such capable and compliant digital servants around us at all times to retrieve what we are looking for or to entertain us whenever we wish?

Our increasing dependency on interactive machinery causes us to anthropomorphize our tools, and has brought humanity to what Turkle (2011) calls the "robotic moment." With this term, she suggests that we are now at a point where the interactivity provided by our digital machines of mediation is no longer seen as a second-rate substitute for direct interaction with fellow humans and the physical world. Instead, for some people immersed in digital media, digital interactivity is increasingly the preferred mode.

The powerful control and convenience that interactive digital tools grant to their masters are psychologically addictive enough to ensure brisk sales, but there is another aspect to the stimulation we get from these machines that leads to real chemical addiction. On a basic neurochemical level, we are rewarded when we pay attention to new stimuli. As the first humans emerged from the jungle and adapted to life on the savannah, our brains evolved to provide us with a squirt of dopamine (a pleasure-producing chemical akin to adrenaline) each time we took new stimuli into account. Paying attention to new stimuli in our immediate environment helped to ensure our survival because of the opportunities (*edible fruit in that tree!*) and dangers (*menacing tiger eyes behind that bush!*) that they might entail. (Richtel, 2010). Thus, each time our screen confronts us with something new – whether it be the digitized chime informing us of new messages waiting in our email inbox, or the nearly immediate appearance of a list of previously unexplored websites when we type something into Google's search box – we receive scientifically observable, chemically-derived pleasure in our brains from pursuing this sort of interactivity. When we engage with the flood of stimuli

we encounter via our clicking or touching, checking, and appraising, we are, in psychological terms, engaging in a system of "positive reinforcements," and this system helps to ensure that we will repeat the behaviors more and more. As Carr (2011) puts it, "interactivity gives us powerful new tools for finding information, expressing ourselves, and conversing with others. It also turns us into lab rats constantly pressing levers to get tiny pellets of social or intellectual nourishment" (p. 117). In other words, if you find yourself almost compulsively clicking on your *get mail* icon or repeatedly checking the updates in your online social network, you are not alone. Interactivity is turning us all into compulsive seekers of new and digitally-delivered stimuli.

2. Japan-Based ELT Educators' Stance Regarding Digital Technology

While admitting the very real enhancements digital tools are able to bring to our lives in terms of convenience, task accomplishment, and entertainment, researchers in the professional fields associated with human cognition are increasingly publishing findings that suggest there may be some serious drawbacks to our increasing dependence on such devices. And, over the last few years, these warnings have become more available to the general public through books that deftly compile them and target a wider audience. Prominent examples include *The Shallows* (Carr, 2011), *Hamlet's Blackberry* (Powers, 2010), and *Rapt* (Gallagher, 2009) – all of which have made it onto *The New York Times* Best Sellers lists – as well as *Proust and the Squid* (Wolf, 2007) which received Best Book of the Year acclaims from *Publishers Weekly*, *Library Journal*, and *U.S. News & World Report*. Also, these and other concerned observers are penning cautionary articles that are increasingly appearing on the pages of *The Wall Street Journal*, *The New York Times*, *The Atlantic*, and other prominent and widely read newspapers and magazines. Regardless of whether or not all of their critiques are accurate and justifiable, the point here is that their perspectives are now being aired and are apparently reaching a receptive audience.

Despite this evident trend in wider society, it seems these critiques have yet to make a meaningful impact in the educational sphere, or at least this appears to be true of the world of ELT here in Japan with which this author is most familiar. A tipping point seems to have been reached regarding the incorporation of educational technology into classrooms, and the focus of discussions among teachers in faculty meetings and professional conferences now leans strongly

towards *how to* implement digital tools as opposed to *why* we are implementing them. Perhaps as teachers themselves rely more and more on the connectivity, multiplicity, and interactivity that their own digital tools afford, it is only natural that they become more and more eager to introduce them into their courses. At any rate, the enthusiasm is noticeable, and feels far more widespread than just a few years ago.

To investigate whether this interpretation of digital adoption in Japan ELT is accurate, a simple descriptive analysis of technology-themed presentations offered at three prominent ELT conferences during 2012 was undertaken in order to provide some quantitative insight into the current state of the profession's attitudes toward the digital encroachment. Educational conferences offer the most conspicuous forum for career-oriented ELT professionals to share their views. Also, presentations based on vetted submissions tend to give us more up-to-date insight into the current zeitgeist than peer-reviewed publications do since the latter typically travel a much longer route from first drafts to eventual printing, and this factor of speed is especially important in this case since we are now in a period in which not only the digital tools themselves but also the ways in which we are incorporating them into classes is changing so rapidly.

The Japan Association for Language Teaching (JALT) is the largest ELT professional organization in Japan with roughly 3,000 members. It has a higher international profile than other Japan-based ELT organizations, and its journals and conferences are generally regarded as showcasing much of the best that Japan has to offer regarding ELT pedagogy and developing trends. Abstracts from presentations that focused on technology from JALT's main international conference held in October, from the technology-specific JALTCALL conference held in June, and from the JALT Pan-SIG conference also held in June were categorized for this study in order to provide a snapshot synopsis of the profession's attitudes toward the increasing digitization of education. Regarding the Pan-SIG conference, *SIG* stands for *Special Interest Group*, and the theme for the 2012 conference was on emerging literacies, including digital and media literacy, so the theme seemed particularly suited to discussions of how digital tools are transforming our students and our pedagogical practices.

Presentation titles along with their abstracts were analyzed in terms of presentation type as well as the stance toward the application of technology evident in the presenter's framing of the reported content and/or results. For this study, *Presentation Type* consists of three groups: *Instructional*, *Progress Report*,

and *Broad View*. The *Instructional* type typically included talks that demonstrated how one might use a certain software application for a particular teaching purpose, discussed how to go about incorporating a particular aspect of technology, or walked the audience through recommended steps for carrying out a particular project or course unit that depends on some aspect of digital media. Examples of actual presentation titles[3] that were placed in this category include *Using iPads in Different Teaching Contexts*, *Developing a Video Board Module for Self- and Peer-Evaluation of Speaking Skills*, and *L2 Reading/Writing Tasks with Simple English Wikipedia*.

Presentations categorized as *Progress Reports* generally shared results of classroom-based action research projects or larger-scale and ongoing initiatives. Even if the project was completely finished at the time of the presentation, as long as the main focus appeared to be on sharing specific results rather than on demonstrating how to do something, it was categorized as a *Progress Report*. Example titles of presentations in this category include *How do Japanese Students' IT Attitudes Compare?*, *English Quest: Applying Game Mechanics to a Language Learning Classroom Context*, and *Exploring Self-Assessment Strategies in a Blog-Based EFL Speaking Project*.

The final category, *Broad View*, was reserved for presentations that had a comparatively wider perspective. These presentations typically discussed a general technology-based theme, trend, or issue without focusing as much on a particular, context-specific application, study, or project except as a means of exemplifying the broader topic. Examples of presentation titles in this category include *Applying Gaming Theory to Language Learning, Web Technologies*: *Where We've Been, Where We're Going,* and *Digital Literacy: New Classroom Approaches*.

While the example titles provided above generally served as accurate indicators of the category each presentation was deemed to belong to, this was not the case for most titles. For all presentations, an analysis of the summaries provided in the abstracts was used as the determining factor for categorization. These abstracts also were used to reveal each presenter's *stance* (*positive*, *neutral*, or *negative*) regarding the aspect of digital technology being presented. Actually, in the case of *positive stance*, the presenter's attitude was sometimes apparent even in the title. Examples of *Instructional* titles indicating *positive stance* include *OK to be SMall: Smart M-Learning Solutions for ELT*, and *Constructing a Roadmap to More Systematic and Successful Online Reading and Vocabulary Acquisition*. More often, however, *positive stance* presentations had titles that appeared to be

neutral, but their abstracts revealed their stance. In most cases, multiple instances of positive evaluative words and phrases offered without any discernable hedging indicated the presenter's clearly positive attitude toward the technology topic or the digital tool that enabled the project. For example, one such abstract[4] tells us that "Apple's iPad is a *powerful*, *flexible*, and *revolutionary* piece of educational technology" and offers to teach "various *practical* ways that this *amazing* tool is being used today." Another abstract, while less effusive, still reveals an unreservedly positive stance by telling its readers that "blogs are a *simple and effective* medium" that "can *tap students' interest*" and allow them to "*support* each other's learning in a *fun and creative* environment."

Progress Report presentations in which the title alone reveals *positive stance* include *Online Forums Motivate Students to Study English* and *iPod Touch for Fieldwork: An Effective Way to Support Overseas Study*. Abstracts of *Progress Reports* with *positive stance* despite seemingly neutral titles included clauses such as "designed to make a *very effective* learning experience" and "the *tremendous insights* it provided instructors." Again, as in the case with *positive stance Instructional* abstracts, there was no rhetorical hedging in these abstracts or perceptible attempts to balance perceived merits with possible demerits. Thus, they were categorized as exhibiting *positive stance*.

Likewise, although *Broad View* presentations were fewer in overall number, they too included some titles that were obviously indicative of a positive orientation. Relevant examples include *Technology is for Everyone: Take the Leap!*, *Technology as an Enabler*, and *The Workbook has e-volved!*

In contrast, presentations that were categorized as *neutral stance* had titles and abstracts that appeared essentially objective in regards to their topic or the technology underlying their project. For example, one abstract that typifies this sort of neutrality in which judgmental vocabulary is studiously avoided explains that "the presenter will describe the development of the program, the issues that are being faced, and the outcomes of an ongoing review of its effectiveness." The potential audience in this case receives no indication whether the presenter is positively or negatively disposed to whatever technology was involved in the program he intends to report on, and so the presentation stance was categorized as *neutral*. Otherwise, and more commonly, the positive remarks offered within *neutral stance* abstracts were framed in rhetorical hedging strategies that exhibited an attempt to project professional objectivity, or the positive assessment was balanced by an admission of possibly negative aspects as well. Examples of

rhetorical hedging include "it was found *for the most part* that learners *seemed* motivated and engaged by the mini-project construct..." and "...the organizational method of word data presented at last year's conference has been *revealed to have a number of limitations* that must be addressed for future development of this technique and its applications." Examples of positive/negative balance include "...the *advantages and disadvantages* of this style of task-based language learning will be discussed...," "...also review the initial implementation *focusing on both positive and negative aspects*," and "...hypertexts *can be a boon* to expert L1 readers but *place excess memory burdens* on beginning or L2 learners."

Any presentation with an abstract indicating an overall negative assessment of technology's role within or effect upon the project, study, or pedagogical issue under investigation would have been determined to have a *negative stance*. A close reading of the abstracts suggests that none of the 109 technology-related presentations given at the three conferences exhibited a stance sufficiently negative to warrant this label.[5]

Table 1
Digital Technology Presentations at Three 2012 ELT Conferences in Japan

Type Stance (+Positive/Neutral/-Negative)	JALT	JALTCALL	Pan-SIG	Total
Instructional	24	19	6	49
Stance	(+18/6/-0)	(+17/2/-0)	(+6/0/-0)	(+41/8/-0)
Progress Report	16	19	8	43
Stance	(+6/10/-0)	(+7/12/-0)	(+1/7/-0)	(+14/29/-0)
Broad View	6	4	7	17
Stance	(+5/1/-0)	(+2/2/-0)	(+3/4/-0)	(+10/7/-0)
Total	46	42	21	**109**
Stance	(+29/17/-0)	(+26/16/-0)	(+10/11/-0)	**(+65/44/-0)**

The results in Table 1 indicate that not only were there no presentations given with an overtly negative stance regarding technology, but that the majority of presentations (65 of 109, or 59.6%) expressed decidedly positive attitudes about our digital tools. We can also say that while the conferences differed somewhat from each other in terms of the ratio of presentation types they offered, overall it is clear that *Instructional* presentations and *Progress Reports* far outnumbered the *Broad View* type; the latter constituting only 17 (or 15.6%) of the 109

presentations delivered.

The type of presentations in the *Broad View* category can be said to be exploring the *why* of technology implementation, while *Instructional* and *Progress Report* types are generally oriented toward the *how* of specific implementations. Since nearly 85% of the total number of presentations have a *how* orientation, and over half of them reveal on overtly positive disposition toward digital technology while none of the presentations can be said to offer a negative perspective, it seems as if my hypothesis regarding widespread acceptance along with a sort of positive groupthink regarding the digitization of education does indeed exist within the world of Japan ELT, at least in the 2012 incarnation of its general mood as represented by professional conferences. The evident tendency to more often than not give a positive frame to technology's role in ELT might simply be due to the honest impression of the majority of presenters that the digitization of our profession is indeed a wonderful development that ought to be embraced wholeheartedly. But if this is so, it contradicts a more ambivalent attitude regarding the rapid shift to digital that appears to be increasingly evident in our wider society and which has already been alluded to. In the following section, in the interest of raising some important cautions that seem to be mostly missing in the discussion of technology within ELT, the major strands of the emerging critique of society's massive shift to digital are further explored.

3. Critical Perspectives

Those little digital devices that more and more of us carry around wherever we go encapsulate truly transformative technology. They allow us to easily overcome the limits of time and space by connecting us to the people and things we care about. They let us make fuller use of every waking moment – even the moments that used to be considered "down time" (e.g., commuting, waiting in lines) – by making it possible to work on tasks and entertain ourselves wherever and whenever we choose. And they even provide us with little boosts of neurochemical stimulation as we attend to the various enchanting distractions that they offer. Why would anyone dare criticize such a wondrous and wildly popular breakthrough?

Indeed, until a decade or so ago, despite a few notable exceptions such as Neil Postman (1992) and Sven Birkerts (1994), the few cultural critics who were voicing cogent reservations about the implications of this massive societal shift to a digital medium seemed to have had trouble finding a wide audience. It is

as if we were all so preoccupied with learning how to use our shiny new digital tools that we had neglected to take the time to develop serious critiques. After all, the technology still changes so quickly and the initial learning curve was steep: It has been difficult enough just to keep up. Those who opted out of the rush to digital mostly kept their doubts to themselves, perhaps recognizing the futility of opposition while the crowd's impetus was so strong. On the other hand, the enthusiasts[6] and their bestselling books were easy to find throughout the 1990s and the first decade of the new millennium. More recently, however, the cautious and critical voices seem to be mounting to a chorus, to the point that many commentators now see evidence of a robust backlash (Jurgenson, 2012; Lucas, 2012; Anderson, 2009).

The main voices in this emerging resistance come from a great variety of professional backgrounds and therefore bring diverse perspectives to the debate. For the purposes of this paper, however, it is possible to categorize their arguments against our exuberant acceptance of the ubiquity of digital devices into three general strands: the threat to productivity and creativity, the threat to an individual's interior life and cognitive depth, and the threat to human communication and relationships.

3.1 Productivity and Creativity

Most of us spend significant parts of our lives as either students or workers. And, in these roles, we are typically evaluated by how productive and creative we are. Given the pervasive pressures to perform that this leads to, it is no wonder that in our workplaces and schools we find ourselves leaning more and more on the digital tools that promise to assist us in this regard. They help us by serving up information to us nearly as quickly as we request it, and by allowing us to juggle various tasks simultaneously so that our time spent on them, while still finite, seems more fully utilized than ever before. But is more necessarily better? Does the easy availability of a steady stream of multifarious information really provide the human mind with an ideal environment in which to think, apply knowledge, and come up with creative solutions?

Major advances in functional magnetic resonance imaging (fMRI) scans over the last couple of decades mean that claims about how the human mind thinks can now be backed up with hard science. When neurocognitive scientists conduct studies to see how the brain functions, they are using fMRIs to look at blood flow

patterns in the brain's various regions as subjects are confronted with particular tasks, since blood flow increases signify increased mental activity in those regions (Rosen, 2008). Especially in the last decade, there have been a great many such studies devoted to one of the big questions of our digital age: Are humans good multitaskers? The trend in the results so far is quite clear, and a consensus has emerged: The answer is *no* (see Carr, 2011; Rosen, 2008; and Wolf, 2007 for overviews of the empirical research).

Our brains are not good at multitasking. In fact, the notion that humans are able to simultaneously attend to more than a single task is essentially a myth. When we think we are focusing on a variety of tasks at the same time, what we are really doing is shifting our attention back and forth between the tasks as rapidly as we can. And, in fact, evidence suggests that we do not perform this switching as rapidly as we might imagine. Time is lost each time that attention to one task is interrupted and reoriented toward another. The longer the interruption, the longer it takes to return to the degree of concentration that had been devoted to the original task. But even short interruptions have consequences: Some researchers estimate that a one-minute interruption takes an average of fifteen minutes to fully recover from (Powers, 2010). As Jackson (2008) puts it, "the brain takes time to change goals, remember the rules needed for the new task, and block out cognitive interference from the previous, still-vivid activity" (p. 79). Scientists use the term *switching costs* to refer to this taxing of our mental resources each time we try to reorient our mind's focus. This loss in concentrative power might be acceptable if interruptions were rare, but these days digital screens constantly beckon students and workers. The resulting loss in productivity adds up: Basex, a leading management research and advisory firm, estimates that time lost at typical organizations due to interruptions constitutes as much as 25% of the typical work day (Spira, 2009).

The person who drinks coffee while driving his car is able to do so because the coffee drinking, and probably some aspects of the driving as well, have become automaticized through repeated experiences. Engaging in an automatic action does not require a significant level of conscious attention. But when the automaticity is interrupted (e.g., by a bump in the road causing some coffee to spill), the impossibility of attending to two things at once is quickly felt and can all too easily lead to undesirable consequences (e.g., a stained shirt or a traffic accident). The person attempting to converse with a friend while checking her email is in fact switching back and forth between the two tasks and likely performing both

poorly due to our cognitive incapacity to refocus attention so quickly.

Thus, while digital cheerleaders tout multitasking as a new human skill enabled by our digital devices, cognitive scientists seem more inclined to attach a less appealing label to what is being enabled: namely, incessant interruptions. As Clifford Nass, a Stanford scientist whose research suggests that multitasking weakens concentration, has bluntly put it, frequent multitaskers are "suckers for irrelevancy" (cited in Gorlick, 2009) because they have a reduced ability to filter out interference. They too easily allow themselves to be distracted.

The term *continuous partial attention*, originally coined by Stone (2008), is being used more and more frequently to describe the frazzled mental state of supposed multitaskers. And our digital tools, which just a few years ago were mostly parked upon our desktops but now increasingly accompany us in their handheld manifestations wherever we go, incessantly beckon us to engage in this mythic multitasking activity. If our attention to whatever task is at hand can increasingly be characterized as *partial* due to our compulsive monitoring of what our digital antennae are picking up, we have fewer opportunities to enter the mental state of *flow*: the optimal state of mental engagement as defined by the seminal work of Mihaly Csikszentmihalyi (1991) in which time and all distraction seem to fade away as complete mental immersion takes over. It is common for top athletes to refer to this mental state as *the zone*, and much of their training is oriented toward being physically and mentally able to slide into it when competing since they know from experience that this is the state that fosters optimal performance. Gallagher's (2009) use of the term *rapt* essentially refers to this same mental condition, defining it as a "completely absorbed, engrossed, fascinated, perhaps even carried away" state of full mental focus, and claims that it underlies "life's deepest pleasures, from the scholar's study to the carpenter's craft to the lover's obsession" (p. 10). Whatever term we decide to use, it follows that students and workers who rarely achieve this state of mental flow, who are more accustomed to juggling distractions than experiencing full immersion in a single task, are less capable of optimal performance or of coming up with complex and creative solutions to whatever challenges they confront. Their mental resources are divided; they are not fully focused on the task at hand.

If the generative powers of a non-distracted human mind are something that we still value, then studies that look at how many distractions workers and students are actually dealing with in an average day are not encouraging. For example, one study found that office workers who use computers typically check their

email thirty to forty times per hour (Renaud, et al., 2006). If this figure seems unbelievable, keep in mind that the same study found that these workers vastly underestimated the number of times they check email when questioned. This gap between self-reporting and actual behavior underscores the compulsive aspect: When it is so easy and neurochemically rewarding to do so, we feel induced to search for new stimuli at a nearly unconscious level. As for students, a recent study of U.S. teenagers (Nielson, 2010) found that they are now sending or receiving on average more than 3,000 text messages per month: an average of over six messages every waking hour, presumably including the hours they are in school. What these studies point to is not simply a shocking rise in the amount of distractions, but also the fact that more and more of our distractions, whether they involve writing a text message or checking a friend's status on Facebook, are social in nature. The solitary contemplation and deep reflection made possible when one separates from the crowd and cultivates a rich interior life seem to be threatened by the trend to spend more and more of our waking moments oriented outwards in order to maintain our burgeoning stores of social connections via our digital tools.

3.2 Interior Life and Cognitive Depth

Powers (2010) succinctly characterizes the growing imbalance between inward and outward mental modes as follows:

> Of the two mental worlds everyone inhabits, the inner and the outer, the latter increasingly rules. The more connected we are, the more we depend on the world outside ourselves to tell us how to think and live. There's always been a conflict between the exterior, social self and the interior, private one. The struggle to reconcile them is central to the human experience, one of the great themes of philosophy, literature, and art. In our own lifetime, the balance has tilted decisively in one direction. (p. 2).

Our digital tools allow us to express ourselves publicly and to broadcast our thoughts and preferences with previously unimaginable ease. Turkle (2011) tells us that it is now increasingly common for young people to seek nearly real time validation via texting or their online social networks for the emotional reactions to everyday incidents that swell up inside of them before, or even in place of, internally confronting and exploring those emotions on their own. When one's

crowd is always only a click away, it apparently becomes tempting to allow our thoughts and feelings to some extent become contingent upon others. And, as software programmer and virtual reality pioneer Jaron Lanier (2011) warns us, the form of our publicly expressed thoughts and feelings are also contingent upon the contours and limitations of whatever medium and software we employ. Lanier repeatedly warns of the dangers of what he calls *lock in*, meaning that once a particular technological application achieves widespread use, then, as imperfect as that application may be, it essentially becomes too entrenched to change. We thus find ourselves conforming to whatever the limitations are, "reducing ourselves" to fit the software, and eventually we cease paying attention to the degradation since our expectations have been effectively diminished. As Smith (2010) puts it, "Software is not neutral. Different software embeds different philosophies, and these philosophies, as they become ubiquitous, become invisible." So, for example, as our connective tools tempt us to become increasingly outward-oriented creatures and to entrust our expanded sociality to Facebook and the facile conceptualization of friendship it promulgates, we may be reducing the quality and depth of our interactions even as the quantity and breadth of them expands.

While particular digital applications can lead to lock in and cause us to reductively conform to them, the digital medium in general is more typically credited with expanding our possibilities when compared to the strictures of the media that preceded it. This can clearly be seen in the case of writing, which is generally considered to be the invention that has had a bigger impact on human cognition than any other tool yet devised (Ong, 1982). The dominant medium for writing has shifted from print to digital, and the characteristics of the new medium, even when not reductive, naturally have a washback effect on the users of the technology. As Marshall McCluhan (1964), that oft-quoted guru of media transformation, noted roughly half a century ago, "we shape our tools, and thereafter our tools shape us."

The fact that most writing is now undertaken within a technological platform that has an inherently outward orientation is somewhat ironic since it is the invention of writing and its corollary, reading, roughly 5,000 years ago that is generally credited with deepening and expanding the interior life of humans. Whereas previous generations kept private diaries for recording their personal thoughts, today people are more likely to blog such thoughts or announce them via Twitter or Facebook for the world to see. The shift from orality to literacy, the most significant media transformation humanity has undergone, entailed cognitive

losses (e.g., memory capacity) while ushering in a great many cognitive benefits as it freed our minds up to focus on more complex issues than remembering our immediate culture's history and practices (Havelock, 1986; Ong, 1982). It did this by, in effect, outsourcing the more tedious aspects of human memory to the written page, and this meant that human knowledge became cumulative across generations as it never had been before. Now, for example, thanks to literacy we have direct access to the thoughts of Aristotle and other canonical thinkers: We do not have to start the inquiry process into existential questioning or other fields of complex contemplation from scratch, nor do we have to rely on an incomplete and ephemeral rendering from an oral storyteller to tell us what Aristotle and others said in their time. And engaging in literacy is not simply a passive activity in which we absorb the ideas of the great thinkers who have preceded us. Rather, it is a deeply generative and constructive process: Both reading and writing encourage a sort of private dialectic in our minds as we question what we read or debate with ourselves how to most succinctly express our intentions in written form. As Wolf (2007) notes, "Every child who learns to read someone else's thoughts and write his or her own repeats this cyclical, germinating relationship between written language and new thought, never before imagined" (p. 66).

   The full reaping of the benefits from these two factors, the freeing of the mind and the possibility of interiorized interaction with accumulated knowledge in order to generate new thoughts, tended to be limited to an elite few in most societies until the sixteenth century. With Gutenberg's invention of the printing press, however, much wider dissemination of written works suddenly became possible. The strong position on technological determinism credits the advent of the printing press with ushering in the Age of Enlightenment, the birth of science, and all that has hence issued forth from them. In other words, we have successfully traveled to the moon because of the way our technology for writing and reading evolved. Also, this strong position holds that dominant technology deeply affects what we choose to value as a society. As Powers (2010) puts it, "the values of freedom and equality that we cherish today took root through the spread of reading and the power it conferred on individuals to think for themselves" (p. 133). Others (e.g., Lucas, 2012) prefer a less deterministic view of technology, arguing that any new technology that is rapidly adopted is more accurately viewed as a manifestation of society's changing preferences rather than the factor that determines them.

   Whether our newly dominant digital media are causing or rather just reflecting a change in the way we organize and apply our thoughts, the result that humanity

faces is the same: Our way of thinking is changing as our primary tool for thinking gets replaced. And the value system that underpins our thoughts is undergoing change as well.

For example, how much do we really value privacy anymore? Over the course of the last decade, many of us have no doubt experienced firsthand the proliferation of notices of "privacy policies" coming from workplaces, banks, and other organizations that store some of our personal data, and this might lead us to believe that, yes, privacy is still highly valued in society. But it is also possible to see this boomlet in privacy regulation as a rearguard action representing an admirable but ultimately doomed attempt to plug widening holes as organizations have come to realize just how porous the digital environment has become. Pariser (2011) and Keen (2012) chronicle in thorough detail the current erosion of privacy brought about by the digital revolution, and which is now greatly accelerating due to the explicitly social emphasis of Web 3.0. Importantly, a noticeable subtheme in their works is the evidently nonchalant reaction of most people to these fundamental changes. It seems we are generally willing to sacrifice much of our privacy in pursuit of ever more connectivity. We have entered uncharted territory here: It is a world in which Mark Zuckerberg, the still youthful CEO of Facebook, a company that now astonishingly boasts over *one billion* active users each month (Rosen, 2012), can openly declare that "we want to ensure that every experience you have will be social" (cited in Keen, 2012). And when asked about the need for privacy, Zuckerberg flippantly replies that "that social norm is just something that has evolved over time," (cited in Smith, 2010) thereby implying that it is acceptable if it now devolves, and yet he faces no massive backlash for his cavalier attitude toward radically demoting a once-cherished value that just so happens to be codified in many modern democracies as a basic right of citizens. It is also a world in which the World Economic Forum saw fit to declare personal data as "a new asset class" for the global economy (*World Economic Forum Report*, 2011), thereby making clear to all that, although the business side of undermining privacy is usually dressed up in attractive communitarian slogans (e.g., *social media*, *the social Web*, *Web 3.0*) it is propped up by a very real profit motive.

Why might we be concerned about the erosion of privacy? The first answer that comes to mind is usually political: Some worry that the assumed barrier to a future Orwellian scenario of thought police and constant surveillance has been significantly breached. As Julian Assange, the founder of *Wikileaks*, is fond of

reminding us, the Internet is "the greatest spying machine the world has ever seen" (cited in Kingsley, 2011). Besides this concern, however, a subtler danger lurks. The ability to carve out a private space and cultivate a rich interior life are at the heart of our ability to think deeply and, most philosophers would agree, to live meaningfully.

This sort of "depth" is not easy to define. Powers (2010) calls it "the quality of awareness, feeling, or understanding that comes when we truly engage with some aspect of our life experience" (p. 11). It is based on the ability to be contemplative which, in turn, is dependent on a well-developed sense of individual identity as well as the complex interiority that comes with this sense. This is the mental environment that best suits deep and original thought processes. As Carr (2011) observes, the cognitive goal of individuals in a society that cherishes depth is "to construct within our own minds the rich and idiosyncratic set of connections that give rise to a singular intelligence." And, it just so happens that the human invention which perhaps most consistently and successfully sets the cognitive scene for this sort of "singular intelligence" to emerge is reading. However, it is not the case that any sort of reading will suffice. For example, quiet and solitary reading was, surprisingly, hardly known until about 1500 years ago. As Manguel (1996) explains in rich detail, the first known instance in the Western world of a person quietly reading to himself was recorded when Saint Augustine mentioned in his *Confessions* that he witnessed the bishop of Milan do so in the late fourth century. Augustine registered his surprise at seeing something so unusual, and reports that the bishop claimed that the practice "refreshed" his mind. In other words, for the first 3,000 or so years of the history of reading, it was not considered a private and interior activity. Words on a page were construed as a graphically recorded oration to be delivered repeatedly to audiences. Reading was a public event, and its outward-orientation did not necessarily encourage inward reflection.

At the other end of history, mounting evidence suggests that the type of reading that we are now primarily engaging in with our digital screens, a less linear process that is more akin to skimming and scanning, is also not as conducive to deep and critical thinking as the comparatively restrictive confines of print (Carr, 2011; Wolf, 2007). The austere and limiting qualities of the printed page as it developed over time (e.g., black letters on white pages, mostly linear progression, standardized typographical features and formatting rules, minimal visual embellishment) served to shut distractions out rather than welcome them in (Kress,

1998). This shunning of deviations from the established norm can at times be seen as potentially negative due to being overly derivative (Lanham, 1993), but in a positive sense it is a medium that allows its users to literally forget about it. That is to say, it invites readers to engage in the pretense of the medium's transparency (Mach, 2005). Of course our minds sometimes wander as we read printed pages, but what the medium encourages and idealizes via its conceptualization of the reading process is for the reader to forget about the medium itself and to feel as if she has entered a direct interiorized dialogue with the writer.

The cognitive automaticity that enables the coffee-drinking car driver to achieve those two tasks at once is relevant here. The typical minimalism and standardization that came to be associated with the printed page invites automaticity: When a medium seemingly becomes "invisible," it can no longer distract us. Skilled readers have achieved a high level of automaticity in the decoding of written words, freeing up the mental resources needed for interior dialogue and contemplation to occur while reading. It is precisely this ability to sustain the automaticity of the reading process in sufficient enough spans to allow for the reaping of interior cognitive benefits to occur that Maryanne Wolf (2007), Director of the Center for Reading and Language Research at Tufts University, most fears we are losing when our reading material moves to the more distracting environment of digital screens. In its austerity, the typical printed page offers a vastly different interface than the visually rich, multimodal, and outwardly linked environment that we encounter when we gaze at digital screens and try to pay attention to all that they offer. As Carr (2011) points out, the greatest paradox of the Internet is that it "seizes our attention only to scatter it" (p. 118).

DeStefano and LeFevre (2005) conducted a comprehensive review of 38 research studies that each, in one way or another, compared the efficacy of hypertext reading on the digital screen to the more linear process that occurs on the printed page, and the overwhelmingly clear conclusion is that the online medium yielded inferior cognitive gains in its readers compared to its printed counterpart. Lucas (2012) summarizes the results of those studies thusly: "Rather than offering stimulating opportunities for the non-linear exploration of topics, as was once thought, the constant navigational possibilities encountered on a hypertext page added a significant cognitive overhead, as the reader was asked constantly to choose between the text before her and some other temptation" (p. 64). Of course, it is not an all or nothing dichotomy, but a question of the types of cognitive engagement each technology tends to invite or discourage. As Carr puts

it, "It's possible to think deeply while surfing the Net, just as it's possible to think shallowly while reading a book, but that's not the type of thinking the technology encourages and rewards" (p. 116).

As Wolf (2007) reminds us, the evolving relationship of readers to text over time can be seen as a revealing index of the history of thought. We are shifting into an era in which thought tends to be more socially constructed and outwardly validated than it was during the more interiorized and idiosyncratic age of print.[7] Labeling the latter as cognitively "deeper" might simply reveal the biases of the passing age, but in the Western tradition, from Seneca to Thoreau, the benefits of the private contemplative life and the complexity and creativity of thought that arise from pursuing it have been so thoroughly explicated and extolled, that we at least ought to proceed with due caution as we move on, rather than allowing the age of privacy and interiority to slip away unnoticed as we follow the siren call of social connectivity and all that it offers. The shift to Web 3.0 promises to enmesh us in richer sociality through constant connection, but in fact concerns about the quality of the social relationships that our digital medium fosters and rewards is also an important strand of the overall critique.

3.3 Human Communication and Relationships

The most direct and obvious detrimental effect that our digital bonanza is having on our ability to engage in real time relationship-building, such as the type that occurs in face-to-face conversations and sharing meals together, is simply the time that we now devote to interacting with our digital tools instead. As data regarding the growing centrality of these machines in our lives accumulates, such as the fact that U.S. teens now spend an average of 7.5 hours per day in the digital world (Lewin, 2010), it's natural to wonder what is being sacrificed due to this radically altered allocation of time. What did teens who grew up before the digital age do with these 7.5 hours each day? How much of the communion with the real world and real people that was previously taken for granted as part of the growing up process has been forsaken by young people today? The massive extent of this shift to a new cognitive and social environment is unprecedented in its rapidity. Small and Vorgan (2011) suggest that our brains are now undergoing the quickest and most dramatic changes since our ancient ancestors invented their first rudimentary tools. While critical and even alarmist opinions about these changes among the handwringing pundit class are easy enough to find, we still do not have

enough data from empirical studies regarding the long-term effects on human development to warrant definite conclusions (Rosen, 2007). Young people today, up to the age of twenty or so, are our first true generation of widespread digital natives, and are thus in a sense humanity's guinea pigs in regards to this question of long-term developmental and social consequences.

Sherry Turkle, an anthropologist at M.I.T. who studies the cultural ramifications of the digital revolution and robotics, has written the seminal work on how our digital devices appear to be affecting our face-to-face interactions, and the title of this book, *Alone Together* (2011), succinctly captures the gist of this strand of the general critique. In it, she reports on the results of countless interviews she has conducted with young people regarding their digital habits and opinions about technology, and her conclusions are riveting. The crux of her argument is this: "Networked, we are together, but so lessened are our expectations of each other that we can feel utterly alone. And there is the risk that we come to see others as objects to be accessed – and only for the parts we find useful, comforting, or amusing" (p. 154).

Several surprising themes emerge in Turkle's interviews with young people. One is an avoidance of real time communication, including phone calls. As one of her subjects says about texting, "You have time to think and prepare what you're going to say… There's planning involved, so you can control how you're portrayed to the person, because you're choosing these words, editing it before you send it… A phone conversation is a lot of pressure. You're always expected to uphold it, to keep it going, and that's too much pressure" (p. 190). Another says about phoning, "A call feels like an intrusion, as though I would be intruding on my friends. But also, if they call me, I feel they are intruding" (p. 203). Both of these comments can be seen as partly attributable to the changing view of time management that our digital tools have helped bring about. Young people now expect to be able to respond to others at times that they choose and on their own terms. Intrusion into each other's real time feels discourteous.

Another interviewee is more blunt about the time efficiency issue: "Texting is more direct. You don't have to use conversation filler" (p. 201). When not sufficiently exercised, social skills such as the ability to successfully engage in the subtleties of a face-to-face conversation, like any other set of skills, are susceptible to atrophy. As Gary Small, the Director of the UCLA Center on Aging, puts it, "As the brain evolves and switches its focus toward new technological skills, it drifts away from fundamental social skills, such as reading facial expressions during

conversation or grasping the emotional context of a subtle gesture" (Small and Vorgan, 2011, p. 77). When we consider all that can be communicated through non-verbal cues and the stance indications that fillers and such are able to convey in face-to-face conversations, it's tempting to wonder whether the admittedly efficient domain of texting might also be impoverishing us in some important ways.

With the escalating migration of our social spheres to new online environments, the etiquette of conducting relationships is apparently evolving. Facebook has somehow managed to turn the word *friend* into a verb, and when using this and similar social networking sites to "friend" people, we find ourselves "listing" our friends, "tracking" them, "editing" them, and "managing" them instead of being physically present for them as used to be the primary expectation of friendship. We can elevate or downgrade our friendships with a few taps on our screens, or at least our tools give us the illusion that we are doing so. And, as young people increasingly experience socialization through digital media, how much of what they learn there gets carried back to the physical world? As Rosen (2007) asks, "What unspoken rules and communal norms have the millions of participants in these online social networks internalized, and how have these new norms influenced their behavior in the offline world?" Carr (2011) is not optimistic. He concludes his 200-some page critique of the changes we face by citing recent studies that suggest that the increasingly hurried and distracted lives we lead when digitally immersed result in reduced capacity to feel empathy, compassion, and other higher order emotions that allow us to bond and maintain relationships in distinctly human ways.

The generational divide brought about by digitization is keenly felt by many in education who see the changes occurring before their eyes on a regular basis. As one professor of a small liberal arts college expressed it, "This is where I find the generational impact the greatest -- not the use of the technology, but the *overuse* of the technology" (cited in Rosen, 2007). But this generational aspect of our shift can also lead to sometimes flippant scapegoating, with young digital natives being labeled as "narcissists" and "exhibitionists" as they race to accumulate "friends" and incessantly broadcast and revise all their "likes" and "dislikes" on their profile pages in whichever social media sites they frequent. To their credit, some digital critics are conscious of this tendency, such as Franzen (2011) who recognizes that, "very probably, you're sick to death of hearing social media disrespected by cranky 51-year-olds." But disrespect it he does, as do many in the digital

immigrant generation as they try to come to grips with the changes afoot. Turkle's (2011) interviews, however, are a valuable resource because they reveal the vulnerable and anxious side of digital natives who know no other way of life and yet express an evident nostalgia for a time when communication and relationships were not so heavily mediated. She chronicles a generation that is used to living about half of their waking hours in virtual places, and yet they wistfully talk about face-to-face conversations, handwritten letters, and the welcome anonymity and privacy offered by public pay phones. One of her 18-year-old subjects rightfully points out that there is a big difference "between someone laughing and someone *writing* that they are laughing… My friends are so used to giving their phones all their attention… they forget that people are still there to give attention to" (p. 268). Turkle paints a portrait of a generation starved for meaningful face-to-face attention, and points out, as Powers (2010) also has, that these young people are the first to grow up with parents who chatted on their cell phones while pushing them on swings at the park, and stole glances at their favorite websites while also trying to give a hand with homework at home. "Children have always competed for their parents' attention, but this generation has experienced something new. Previously, children had to deal with parents being off with work, friends, or each other. Today, children contend with parents who are physically close, tantalizing so, but mentally elsewhere" (p. 267).

Like teenagers and young adults of every generation before them, today's digital natives are actively engaged in trying to both discover and construct their identities. But this is the first generation that feels compelled to do so publicly via social media. Turkle's interviews include many teenagers who feel extremely anxious about the upkeep of their online profiles. As one young man tells her, "When you have to represent yourself on Facebook to convey to anyone who doesn't know you what and who you are, it leads to a kind of obsession about minute details about yourself… you have to think carefully for good reason, given how much people will look at your profile and obsess over it" (p. 184). And so, goaded by the insecurities of youth and the desire to engage in the same activities that their peers do, they carefully construct profiles that they hope will appear attractive. The medium gives them a measure of perceived protective distance, however, and so stretching the truth in online profiles is common. The technology makes possible easy detours into the *performance* of identity creation, much like actors trying out a new role, rather than encouraging engagement in a more probing search for one's real identity and how best to nurture its actual potential.

The danger is that, as Turkle (2011) points out, "Over time, such performances of identity may feel like identity itself" (p. 12). Rosen (2007) asks the key question: "In investing so much energy into improving how we present ourselves online, are we missing chances to genuinely improve ourselves?" As our virtual selves evolve into attractively idealized and complex personas, our real selves may be suffering from a paucity of opportunities to discover whom we really are through the give and take provided by real time communication and relationships.

4. Implications for ELT Educators

While preliminary results are not encouraging, for the most part the jury is still out regarding just how negative an effect the various aspects of the critique offered above are having on human productivity, identity, and social behavior. Also, other studies indicate areas in which our cultural shift to a digital platform might actually enhance human skills. Improved hand-eye coordination and reflex response (Carr, 2011), as well as enhanced visual-spatial recognition skills such as expanded peripheral vision (Small and Vorgan, 2011), are evident in heavy users of digital tools. Nonetheless, since we cannot all be employed as air traffic controllers and racing car drivers, these enhancements are not likely to amount to equal compensation for the losses in higher order cognitive and social skills that we might be incurring in exchange.

What these suggestive findings might imply for the direction that education in general, and my specific milieu of ELT in Japan ought to take is a complex issue. In essence, it comes down to what we as teachers see as our primary role in the classroom. If English educators see themselves as only responsible for helping students to improve their English skills, then a balanced approach of caution and exploration seems appropriate. Caution is needed to sift through the hype of new learning applications and approaches that mimic the busy and distracting environment that is typical of digital media in general. Research repeatedly shows that less is more when it comes to supporting students' ability to concentrate and retain new information in long-term memory. Without caution and a balanced perspective on technology, even the best pedagogical intentions with regard to incorporating technology can all too often lead to a scenario of "distracted students sitting in screen-lined classrooms half listening to distracted teachers" (Powers, 2010, p. 159).

On the other hand, willingness to explore new avenues for effective teaching

that digital tools make possible is also necessary. For example, preliminary studies on the possibilities of applying aspects of digital gaming to educational tasks look promising (Gee, 2007). Students captivated by well-designed games on their digital screens are often happily engaging in repetitive tasks in order to get closer and closer to achieving goals defined by the game, and they can approach the state of mental flow that deep learning so often involves as they immerse themselves in the simulative experience. It is easy to imagine the positive impact such a learning structure could have if successfully incorporated into second language pedagogical contexts. However, whether it be the application of gaming theory or any other adoption of digital technology in the classrooms, the data on 2012 ELT presentations offered above suggests that an explorative spirit and positive disposition toward technology is already the norm in Japan-based ELT.

The more serious ramifications of the digital critique offered in this paper are for those of us who see our role as teachers of the next generation in wider terms. That is to say, they are for those of us who see ourselves not only as instructors of English, but also partly responsible for helping young people acquire the type of life skills that will help them lead meaningful lives and contribute positively to society. When this is the case, then creating an environment that nurtures the skills that digital natives seem to be lacking, as opposed to simply exploiting the skills and interests they already possess for learning purposes (as is the case in the above example of applying digital gaming to language learning), becomes our top priority. In the interest of enhancing their cognitive versatility, if the digital tools that are increasingly central to our students' lives lure them with connectivity, multiplicity, and interactivity, then perhaps in our classrooms we can sometimes construct tasks for them that call for disconnecting, simplifying, and paying sustained attention instead. If productivity and creativity, interiority and cognitive depth, and communication and relationship skills are truly at risk when we rely too much on digital technology, then perhaps the classroom ought to sometimes provide a sanctuary from those tools and all the digitally-mediated connections that they tempt us with. And language classes in particular, because they tend to have smaller numbers of students per class than other subjects, already tend to follow a student-centered approach, and already have a focus on communication skills, might be the ideal place to start addressing the growing imbalance. By fostering real time relationship-building skills, focusing on real identity issues, and offering structured opportunities to expand critical thinking skills without constant referral to the otherwise ubiquitous digital machinery that

is now enveloping society, ELT courses might end up providing the young people enrolled in them with something far more essential than mere English fluency: namely, a strengthening and honing of the set of life skills needed for remaining mentally focused and socially adept while surrounded by a sea of distraction.

Notes

1)   The term *groupthink* in fact predates our digital era, but its usage was at first mostly confined to academic circles. In 1972, research psychologist Irving Janis published *Victims of Groupthink*, the first book to delve deeply into the dynamics of the phenomenon. Now, in the age of social media, the term appears much more frequently in non-scholarly contexts as well. *Hivemind* originally referred to the seemingly collective consciousness observable in social insects like ants and bees, but now is increasingly used to describe instances of similar behavior in groups of humans enabled by social media to think and act en masse. Both terms tend to connote not only the rapidity of group consensus forming, but also a loss of individual creativity and independent thinking, as well as inflated certainty which leads to an illusion of invincibility.

2)   The curious term *real time* is evolving in its usage. At first it tended to refer to computer data systems that are able to produce output immediately as they receive input. More recently, however, it is used to denote time as it is measured and subjectively experienced in the offline world (e.g., an hour feels like sixty minutes), and it is this definition that is used in this paper. This usage of *real time* is often framed as being in opposition to time as it is experienced online, where time can seem slower or quicker, or even stacked and recursive while attempting to multitask with our digital tools.

3)   In this and in sentences in the following paragraphs of this section in which series of three examples are provided, one example is taken from each of the analyzed conference programs in the following order: JALT, JALTCALL, and JALT Pan-SIG. Conference schedules containing all of the titles and abstracts included in this study are available for download from their respective websites:

   http://jalt.org/conference/jalt2012/full-schedule
   http://conference2012.jaltcall.org/schedule
   http://www.pansig.org/2012/index.php/schedule

4)   In this example and subsequent passages from abstracts used to exemplify stance, italics have been added in order to highlight the words and phrases that most clearly reveal the presenter's position.

5)   The presentation closest to deserving a *negative stance* label was a *Broad View* one delivered by me at the JALT Pan-SIG conference. It was entitled *Voices of Caution Along the Road of Shifting Literacy*, and while the abstract contained phrases such as "gradual *abandonment of skills*" and "specific *warnings*", it was categorized as *neutral stance* because it also mentioned a "focus on *new possibilities afforded*" and delivered a balanced review of "which cognitive habits tend to be *promoted or discouraged* by the digital medium."

6)   Powers (2010) refers to them as *digital maximalists* and Pariser (2011) calls them *cybervisionaries.* Among the more widely followed members in this club of digital technology boosters are New York University professor Clay Shirky, author of popular books such as *Here Comes Everybody* (2008) and *Cognitive Surplus: Creativity and Generosity in a Connected Age* (2010), and Kevin Kelly, *Wired* magazine's founding executive editor and author of *What Technology Wants* (2010).

7)   While it is easy to assume that the outward orientation encouraged by the digital medium presents a new frontier for mankind because the technology itself is new, Carr (2011) instead views this

shift as a regressive return to a pre-modern, pre-print state of distraction from which Gutenberg's invention had given us a temporary respite.

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