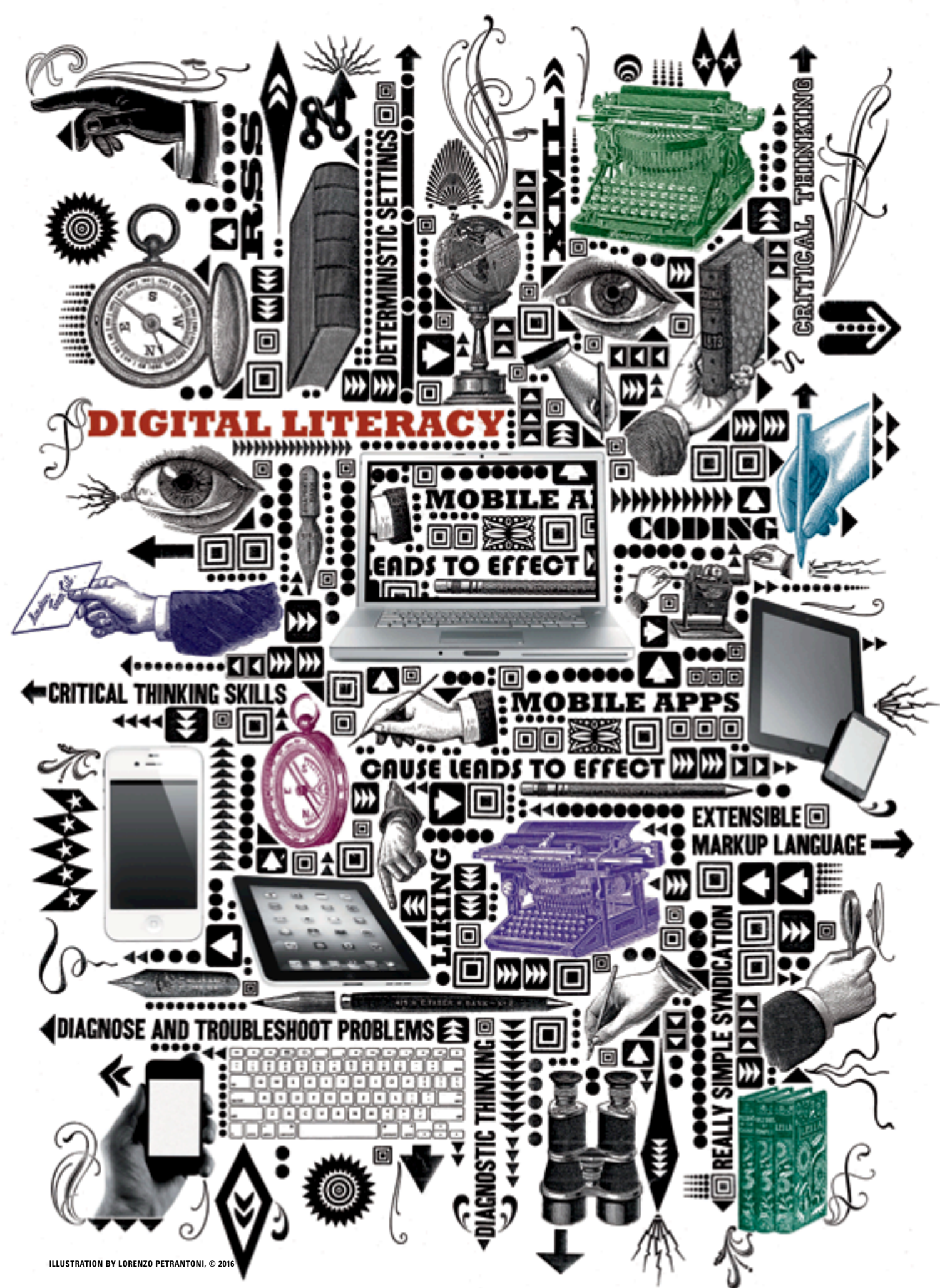


FROM WRITTEN TO DIGITAL: The New Literacy

By Phil Ventimiglia and George Pullman

In his book about the history of the digital revolution, Walter Isaacson contends that the major innovations of the digital revolution—from the first general-purpose computer to the transistor to the iPhone—were all created by individuals who understood how to synthesize the humanities with technology. Yet even though there is much focus in higher education on how we teach using technology (e.g., e-texts, flipped classrooms, adaptive learning, personalized learning), what we teach about technology is just as important. Because technology enables students to solve problems across a range of disciplines, those of us at higher education institutions need to rethink not just *how* we teach our students but *what* we teach our students.



Digital Literacy and 21st-Century Success

In today's world, college/university graduates come into contact with a quickly evolving range of technologies and have access to a wealth of information. Students can be more successful after graduation if they are digitally literate—having learned how to identify and create digital solutions, adapt to new tools, and discover more effective and efficient ways of doing things in their fields. The use of technology has transformed every discipline and career, from engineers to doctors to politicians. Yet the traditional academic experience does not prepare many students for the challenges they'll face in these professions today. For instance, young campaign managers must be versed in tasks such as writing a blog and analyzing a social networking initiative, rather than just planning traditional stump speeches and campaign rallies.

This gap between employers' expectations and students' skills is demonstrated by disparities in perceptions of students' readiness to enter the workforce. In a recent study, when students were asked if they felt digitally prepared for work, 44 percent responded that they felt "well-prepared" or "very prepared." In contrast, only 18 percent of surveyed employers responded that students are prepared for entry-level

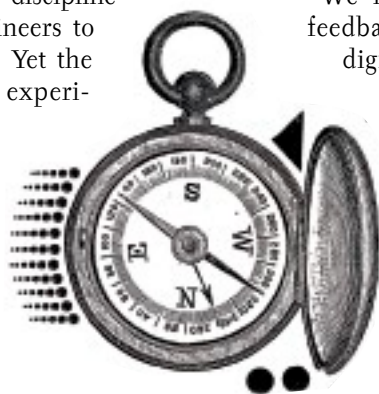
positions.¹ Additionally, employers often find digital tools more valuable than traditional tools in evaluating job applicants. In a Hart Research Associates study, employers found electronic portfolios significantly more useful than a college transcript in assessing whether students had the skills necessary to fill a position: 80 percent of employers found electronic portfolios fairly or very useful, but only 45 percent of employers found traditional college transcripts helpful.²

We have heard the same feedback about the value of digital skills to graduates directly from some major corporations. Jaime Casap, Google's Chief Educational Evangelist, told us: "Digital citizenship is the minimum requirement for the new economy. We need strong digital leaders!" Victor Montgomery, State Farm Business Analyst in charge of local recruitment in Atlanta, stated: "Digital literacy bridges the opportunity divide for students. With that in mind, we are looking for students that display initiative, innovation, and creativity while transforming the communities they live in."³

The need for students to learn digital literacy skills should not be surprising, given that this generation of students has known technology only from a consumer perspective. Whereas older tech-

nologists first experienced technology in the workplace and then found ways to merge technology into their personal lives, the current generation of students first experienced technology as a means of entertainment and social communication. Despite having grown up with access to an increasing amount of technology, students now need to learn how to use technology to solve problems in academic and professional settings. Historically, we in higher education have not readied students for this transition, even though students are increasingly asked to use technology in their learning experiences. Many students enter college having already used technology to complete academic assignments: 75 percent of high school students have accessed class information through an online portal, 52 percent have taken tests online, and 37 percent have used online textbooks.⁴

Learning to write, learning to think, and—these days—learning to form computational structures and to think digitally are requisites not only for employment but also for intellectual independence. Traditionally, the liberal arts have been about learning to think logically and to express ideas. The "liberal" in the liberal arts is about freedom. Some people have argued that widespread literacy (understood as reading at an eighth-grade level) was about making sure factory workers could read manuals well enough to keep machines running, rather than about providing for an informed citizenry. The equivalent for digital literacy would be to define it simply as being able to learn software quickly. Instead, digital literacy should be defined as knowing the effective practices suited to the dominant media. We should not teach students just the skills that will prepare them to follow instructions or quickly comprehend a user interface; instead we should aim to help students develop the expertise that will allow them to combine and create technologies to develop new and dynamic solutions. Just as traditional literacy and the liberal arts have



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been the key to independence since the advent of public schooling, digital literacy today is about intellectual freedom (see figure 1).

Many early digital literacy efforts in higher education focused on providing a single class that covered base-level skills, such as creating a PowerPoint presentation or spreadsheet. But what is truly needed in higher education today is integration of digital literacy throughout the curriculum, so that students are able to do the following:

1. *Find and vet information online.* In the digital world, being able to not only find information online but also determine its quality and validity is crucial.
2. *See problems from digital perspectives.* Students need to be able to analyze a problem and determine how to use digital tools to solve it. For example, can a problem be solved more quickly by creating a spreadsheet or by working the problem manually?
3. *Become self-directed learners.* The Internet has put all of the world's knowledge at our fingertips. Students should know how to take advantage of that availability of information to become lifelong learners.
4. *Obtain digital solutions.* Technology is constantly changing. Students must learn how to evaluate and buy the right digital tools to solve the problem at hand, rather than just relying on the tools they have used in the past.
5. *Learn software quickly.* Software is also always changing and improving, so students need to be able to quickly teach themselves new tools. For example, whereas being an expert in spreadsheets was an important quantitative skillset in the past, now it is increasingly important to be an expert in visualization tools such as Tableau.
6. *Design and create digital solutions.* Ultimately students should build a skillset that allows them to develop or customize their own digital tools.

FIGURE 1. Traditional Literacy vs. Digital Literacy

Traditional Literacy	Digital Literacy
Finding information	Vetting information
Reading (emersion)	Skimming (searching for solutions)
Note-taking	Curating
• transcribing	• linking
Prose composition	Multimodal composition
	• information design
	• data visualization
	• dynamic storytelling (video)
	• coding/programming
Static artifacts	Dynamic assets (multiple, diverse, reusable)
Learns from teachers	Teaches self
Permanence	Change

This does not necessarily mean that students need to be able to write their own applications from scratch. Rather, they should be comfortable customizing and combining tools to create a complete solution—for example, creating a web-form to automate the collection of customer evaluations and then outputting the results to a spreadsheet for analysis.



To understand the fundamental impact that digital literacy can have, we can look to history. **Whenever the dominant medium of communication changes, controversy follows.** When oral communication was replaced by written

literacy as the main means of recording and transferring knowledge—a transformation that took place over decades and at different rates in different places—Socrates was recorded to have complained: “No written discourse, whether in meter or in prose, deserves to be treated very seriously.”⁵ Socrates was concerned that transitioning from oral communication to written literacy would degrade people's intellect. If people learned by reading books, rather than by debating with their elders, they would replace a real education with a superficial likeness of one. They would have the appearance of learning because they could talk about all the things they had read, but they would be unable to think for themselves or even know they needed to, having become accustomed to simply looking things up in books and accepting what they read.

From today's perspective, Socrates' rejection of literacy seems irrational, yet echoes of the same argument are raised about information being found by searching the Internet rather than by combing through printed source materials. As we transition again, this time from written literacy to digital literacy, the fears that Socrates voiced are

resurfacing. We know the transition will be profound and we can't yet anticipate the consequences, so it's reasonable to be concerned. Resistance, however, is as futile now as it was in Socrates' day.

The goal is to teach students how to think in digital ways in order to make informed technological decisions and even, in some cases, to develop their own technology as they gain intellectual independence.

