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# From Digital Literacies to Digital Problem Solving: Expanding Technology-rich Learning Opportunities for Adults

Tyler Frank  
*Pima Community College*

Jill Castek  
*Portland State University, jcastek@email.arizona.edu*

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## RESEARCH REVIEW



### From Digital Literacies to Digital Problem Solving: Expanding Technology-rich Learning Opportunities for Adults

A window into an adult basic education (ABE) class shows several learners typing essays on laptops. Suddenly one student throws her hands up in the air loudly exclaiming, “I didn’t do anything! The computer just erased everything! It wasn’t me, it was the computer!” This scenario is all too familiar with new-to-computer users. Over time, this learner has developed more confidence and digital literacies, and has since passed the Language Arts GED test. However the technology skills needed in the workplace and in daily life go beyond those needed for test taking. Yet computers in adult education classrooms are most often used for test preparation and drill activities. If adults are going to be truly college and career ready, they need to be prepared to skillfully use digital tools and develop a discovery and risk-taking mindset toward navigating online. This column reviews four online articles that provide essential background and useful instructional approaches for teaching digital literacy and digital problem solving in ABE classrooms and beyond (see Harris, n.d.; Quann, 2015; Rosen, 2014; Vanek, 2017).

#### **Basic Digital Literacies vs. Digital Problem Solving**

Harris (n.d.) defines basic digital literacy skills as the physical ability to (1) use digital devices, (2) create and use computer files, and (3) choose appropriate digital applications for different purposes. Digital problem solving, on the other hand, includes navigating a range of digital resources to locate, evaluate, create, and communicate information (Harris, n.d.; PIAAC Expert Group, 2009). U.S. adults lag behind their international

*By*  
**Tyler H.J. Frank**  
*Pima Community College*

**Jill Castek**  
*University of Arizona*

peers in digital problem solving according to an international survey made up of a nationally representative sample ages 16 to 65 called Program for the International Assessment of Adult Competencies (PIAAC). The Problem Solving in Technology Rich Environments (PS-TRE) component of PIAAC involves using digital technologies in a novel online environment to acquire and evaluate information, communicate with others and perform practical tasks in personal, workplace, and civic settings (PIAAC Expert Group, 2009). Therefore, basic digital literacy skills alone are not sufficient for meeting the needs of adults today. They also need to develop the problem solving skills necessary for discerning accurate and reliable information, interacting with public services, communicating with friends, engaging in political activities, gaining employment, and participating in ongoing education.

### Review of the Literature

From a search for openly accessible online articles that address teaching digital literacy and digital problem solving to adult learners, four important and complementary resources surfaced (see reference list). Each author considers ways to integrate digital technology in the classroom. Specifically, all four articles strongly emphasized teaching adults more than just basic digital literacy skills and called for application of digital skills across a wider set of experiences than testing, drill and practice activities. A brief summary of each resource follows.

Rosen (2014) introduces important background to interpret the range and scope of these essentials skills. The resource paints a vision for the future of a population capable of not only using digital tools, but of being able to problem solve in technology rich environments, such as searching and applying for jobs online, to thrive in their daily lives. After articulating goals for teaching these vital skills, Rosen summarizes recommendations for how those goals can be achieved. Both instructional and policy implications are addressed.

Vanek (2017) extensively reviews the construct of PS-TRE and describes how the principles of PS-TRE can be used to inform instruction. In order to focus on the most important aspects of problem solving, she describes three core dimensions of PS-TRE, the task, the technology being used to accomplish that task, and the cognitive dimensions the learner is tapping into while problem solving. She then expands on the cognitive dimensions of the framework by proposing a step-by-step problem-solving process, which she suggests be taught explicitly to learners.

Harris (n.d.) argues for the inclusion of digital literacies in classes for

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English language learners (ELLs) in four categories: basic skills, creating and communicating digitally, finding and evaluating information online, and problem solving in technology rich environments. She emphasizes that those basic skills do not need to be learned before ELLs can begin creating and communicating or finding and evaluating online information. She advocates for designing activities that allow for a realistic use of English for ELLs in a digital setting. As an example, Harris points out that many schools are switching to digital forms of communication requiring ELL parents to be comfortable problem solving in technology rich environments in order to participate in their children's education.

Quann (2015) supports practitioners in helping learners digitally problem solve by giving practical, and immediately applicable, instructional examples. This resource offers a variety of lesson plans focused on helping adult learners use technology to engage in solving different kinds of real world problems. Five common threads cut across these four resources. These themes, taken together, can help guide practitioners in designing impactful learning experiences.

All of the authors agree that tasks for teaching digital problem solving should be authentic. In other words, they should be relevant to learners' needs and contexts for use outside of the classroom. For example, Vanek (2017) proposes an activity where students search for low-cost housing. Quann (2015) connects multiple lessons to learners' everyday needs as well, suggesting students conduct online research to find places where they can access free Internet or low-cost hardware. Thus, they are finding important information for their own lives at the same time that they practice digital problem solving and develop their online research abilities.

In addition, all four authors agree that basic digital literacy skills are not some type of gatekeeping skill for more advanced skills such as problem solving. Instead, basic digital literacies can be learned in the context of digital problem solving. Vanek (2017) points out that teachers can use "simple problem solving scenarios as the context for practicing new computer skills" (p.17). Harris (n.d.) suggests having ELL learners investigate banking practices and create a pdf that explains them to their peers. As a result, learners are not only practicing language skills but are also developing basic digital literacies in real-world settings. Quann's (2015) example of researching low cost hardware or finding places to access free Internet allows students to learn basic digital literacies contextualized within a task in ways that benefit them personally – often working in pairs to take advantage of peer support.

## Not All Tasks Are Created Equal

The idea that basic digital literacies can be embedded within problem solving is a departure from progressions that begin with easy tasks and move into more complex skills. This does not mean however that tasks should not vary in their complexity. Vanek (2017) addresses “complexity factors” (p. 24) which can be adjusted, thus creating a better match for what will best support the student. For example, visual complexity theories suggest that some websites are visually simpler than others and therefore are more easily interpreted and navigated. Another complexity issue involves the number of potential steps a user might go through to accomplish the task. Can the task be completed on one webpage, or must the user navigate through multiple linked locations? By varying the complexity with tasks, learners acquire a range of skills in the act of problem solving.

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## The Task Decides the Tool

The time to decide on the appropriate digital tool to use is after the task has been developed. A digital tool is exactly that, a means to achieve a greater goal. Educators should choose tools that students can utilize flexibly to accomplish a variety of tasks. Vanek (2017) adds that “true digital literacy” (p. 22) is when students are able to choose which tools might best help them complete a task. This provides added complexity yet offers greater personal empowerment, leaving open-ended which tools a student might use to accomplish a given goal.

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## Flexibility in the Teacher’s Role

The digital age we live in necessitates a non-traditional role for teachers regarding introduction of digital tools in the classroom. The four papers reviewed characterize the teacher’s role in various ways: facilitating learning, orchestrating learning, and asking questions (instead of just giving answers). The teacher’s role must necessarily shift based on the context and learners’ comfort navigating online—at times offering responsive support and guidance and at other times providing space for learners to find their own way.

## Digital Problem Solving in the Classroom

The opening scenario focused on a learner who throws up her hands because the computer erased her writing. This learner might seem like a prime candidate for basic digital literacies instruction. And while she would clearly benefit from more knowledge about word processing programs, the articles reviewed suggest that teaching basic digital literacies is far too narrow and

limiting of a goal. Transformative learning is more likely to occur when those basic skills are nested within authentic practices of digital problem solving where learners locate resources, navigate, create, and communicate across a range of digital tasks that are situated in meaningful, real-world contexts.

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### More to Explore

- Networked Communities of Practice (<https://lincs.ed.gov/>)
- Open Education Resources ([https://lincs.ed.gov/sites/default/files/OER\\_Fact\\_Sheet\\_508.pdf](https://lincs.ed.gov/sites/default/files/OER_Fact_Sheet_508.pdf))
- Tools and technologies to explore (<https://cooltoolz.tumblr.com/>)

**Tyler H.J. Frank** is an ABE instructor at Pima Community College in Tucson, AZ and a Master's Degree Candidate in Teaching, Learning and Sociocultural Studies at the University of Arizona.

**Jill Castek** is an Associate Professor in the Department of Teaching, Learning and Sociocultural Studies at the University of Arizona.

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