Highlighting Innovative Practitioner Uses of Digital Technologies in Adult Foundational Skills Instruction

A Center for the Study of Adult Literacy Convening Paper

Dr. Jen Vanek, Director of Digital Learning and Research
at The EdTech Center@World Education

Jeffrey Goumas, Senior Technical Advisor
at The EdTech Center@World Education

Throughout the ongoing COVID-19 pandemic, teachers delivered instruction in new ways, drawing on technology tools and digital resources to support learners whom they could not teach in person (Belzer et al., 2020). To succeed, teachers had to redefine their work—especially in the way they planned or designed instruction (Vanek, in press). This break from traditional instruction served as a laboratory of sorts and illustrated the promise of educational technology (hereafter, edtech) for improving and enhancing instruction.

To explore and learn from the ways that adult educators are experimenting with digital technologies, the final convening of the U.S. Department of Education's Institute of Education Sciences–funded Center for the Study of Adult Literacy included a session focused on this topic.[1] The session titled "Leveraging Digital Technologies for Adult Foundational Skills Instruction" provided an opportunity for attendees to hear about promising strategies, resources, and practices that became visible through technical assistance provided by the EdTech Center@World Education to teachers, program administrators, and state-level leaders leading up to and throughout the pandemic.

The What, Why, and How of Digital Technologies Use

The session began with an overview of promising digital technologies used in adult education programs, made visible through the EdTech Center's work with practitioners before and since the onset of the pandemic. Because the EdTech Center prioritizes setting goals before selecting tools, the technologies described were organized according to their purpose: access and/or creation of content, course management, and communication.

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[1] The Convening on Digital Instruction in Adult Foundational Skills Education: Its Promise and Future was held virtually on July 27, 2021. The event was cohosted by Daphne Greenberg of Georgia State University and Stephanie Cronen and Larry Condelli of the American Institutes for Research and funded in part under Grant R305C120001 from the Institute of Education Sciences.

Digital Content

Teachers draw on a variety of sources to craft or share content to support instruction. Comprehensive online curriculum products from traditional publishers continue to be the core content of distance education, and curated open education resources (e.g., Khan Academy, GCFLearnFree) can provide focused content to round out or supplement instruction (Vanek et al., 2020). In addition, teachers are not bound by content developed by others; they often author their own resources using digital technologies to fill in gaps in instructional content and provide increased learner engagement at the lesson and activity levels. The tools commonly used for this purpose range from simple tools (e.g., Kahoot, Google Apps, YouTube) to more complex course authoring software (e.g., Articulate, Storyline, Rise).

Course Management

Teachers find it useful to provide structure to their digital instruction, especially if they are sharing a multitude of digital resources (Vanek et al., 2020). Using environments such as Google Classroom, simple website building tools (e.g., Weebly, Google Sites), or content management tools (e.g., Wakelet, Padlet), teachers can house resources for easy access. Learning management systems (e.g., Canvas, Moodle, Schoology) do this and also support communicating with learners, creating assignments, and tracking progress. All these resources can scaffold learning by offering an educative organization of learning materials; if done well, the structure can make learning pathways clear, as established in seminal work on elaboration theory by Reigeluth & Stein (1983). Well-constructed, comprehensive online curriculum products also can serve this purpose (Kreil & Vanek, 2021).

Communication and Support

Teachers can maximize engagement in learning by providing direct feedback to learners and facilitating peer engagement and collaboration through a range of digital communication tools (Robinson et al., 2017). For example, video calls can be used for in-person or remote tutoring sessions, when people cannot meet in the same space. Nudges can be delivered through texting apps to keep learners on track or provide some just-in-time support (Alamprese, 2021). Collaboration apps such as Padlet and Google Jamboard can help learners work together on course projects. Any tool chosen must align with learner access, skills, and comfort or be scaffolded to make them relevant and useful (Vanek et al., 2021).

Instructional Modalities

Digital tools and content are deployed in different instructional modalities that create flexible learning options for students. Through ongoing engagement with the IDEAL Consortium, state distance education leaders have shared a gradual increase in the implementation of the most commonly employed modalities: distance education and blended learning or hybrid models (as defined by Murphy et al., 2017). Throughout the pandemic, there has been a surge in remote live instruction and, more recently, pilots of hybrid-flexible models in which students have opportunities to engage in learning synchronously in person or remotely and asynchronously online (Beatty, 2019).

Together, these technologies and content—along with the modalities through which they are employed—shape opportunities for learning. The right combination of these elements supports personalization, enriches instruction, extends learning, makes learning more flexible, and helps learners hone their digital literacy skills through routine use (Rosin et al., 2017).

How Teachers Choose Digital Technologies

Making sound decisions about what digital technologies to use and how to use them is undeniably part of the work of teaching (Vanek, in press). Prior to the pandemic, many activities that integrated technology were relatively passive, such as having students simply go to a website or work on an online lesson. Teachers might have assigned content and checked progress, but the technology tool or resource itself primarily conveyed the instruction. With the onset of the pandemic, teachers had to do everything remotely. This required the selection of digital tools and content to facilitate every aspect of the teaching and learning process (Exhibit 1). This more active engagement with technology adds demands on teacher time and capacity but holds the promise of leveraging the affordances of technology to reimagine and reconstruct adult education.

Exhibit 1. A Shift in the Focus on Technology
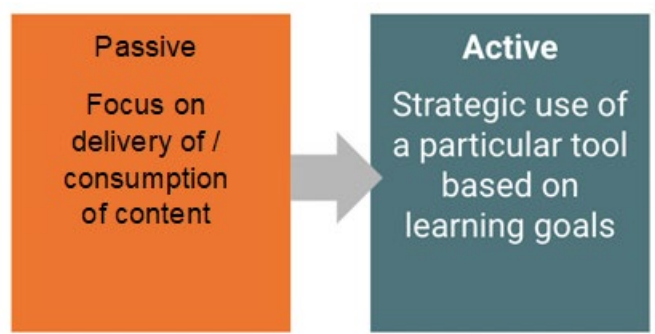

Need to Be Strategic; Frameworks and Tools Help!

Strategically selecting digital resources is a challenge for most teachers, and without some guidance, it is hard to navigate the multitude of options available and make sound decisions. A technology integration framework, especially for teachers who are new to crafting technology-rich activities or lessons (Cherner & Mitchell, 2021; Kimmons & Hall, 2018; Tunjera & Chigona, 2019), can mitigate the tendency for ad hoc decision making related to technology use in instruction. Practitioners looking to be strategic in their integration of technology have found guidance in known research-based frameworks, such as Technological, Pedagogical, and Content Knowledge (TPACK; Mishra & Koehler, 2006); Substitution, Augmentation, Modification, Redefinition (SAMR; SAMR Model, n.d.); the Triple E Frameworks (Kolb, 2017); and customized frameworks and tools designed to fit particular needs, which are described next.

Seven Elements Framework

Developed by the Literacy Assistance Center of New York City (LACNYC), the "7 Elements of Effective Remote + Hybrid Instruction" (Exhibit 2) streamlines and strengthens technical assistance and professional development (PD) efforts of LACNYC. The framework classifies digital tools that teachers might need in remote or hybrid instruction according to why the teachers will use them. The "7 Elements" refer to components of effective instruction, no matter the modality. Within each component, teachers strive for three practices to effect online teaching: (a) ample social presence, (b) interactivity, and (c) learner autonomy. This resource provides guidance for programs in what factors to consider when making tool selections for each element of the framework.

Exhibit 2. 7 Elements and 3 Practices Framework
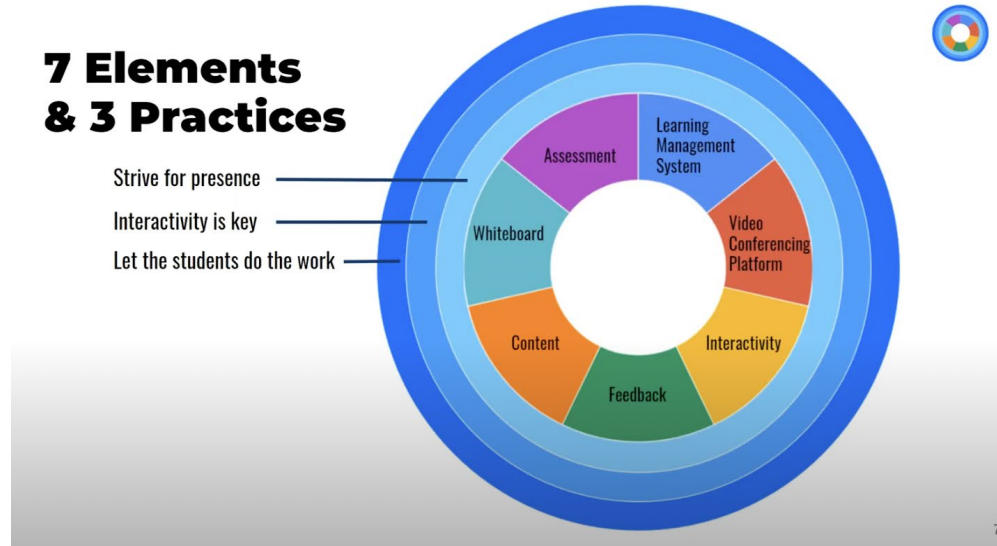
Note. Based on the work of Eckersley and Bell (2021).

Learner Variability Navigator From Digital Promise

Digital Promise developed the Learner Variability Navigator (Exhibit 3) to support research-informed decision making for technology selection and instructional design. The tool and supporting framework make connections to prior research on learners and the factors that impact their learning preferences.

**Exhibit 3. Learner Variability Navigator (Digital Promise, 2021)**
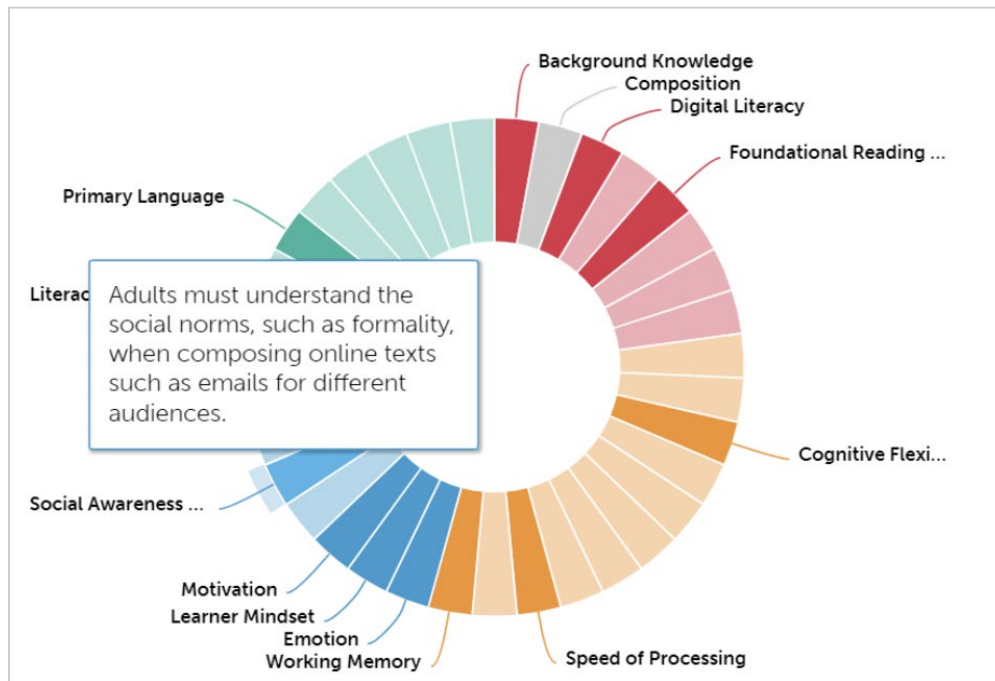
From the Learner Variability Navigator from Digital Promise

The Navigator has four categories of factors: adult literacies, cognition, social-emotional learning, and learner background. As shown in Exhibit 3, the red bars are the literacy factors, the orange bars are the cognitive factors, and the blue bars are the social-emotional learning factors. The green bars include learner background factors, such as primary language. Teachers can use the tools to select the factors that impact their learners. Then the Navigator will list evidence-based strategies that can be effective with those factors in mind. Finally, teachers can make technology choices that will support those strategies.

St. Paul Adult Basic Education Skill and Technology Alignment Guide

Once teachers understand the strategies they want to leverage with students and the objective of a lesson, they can begin the process of selecting tools. Exhibit 4 shows how teachers at the Ronald M. Hubbs Center for Lifelong Learning, St. Paul Adult Basic Education, outline online course development, starting with the content on the left that they want to cover and then moving into the skill areas and the technologies that they want to use to deliver that content. The goal in St. Paul is to map out technology-rich instruction that can be used in class, online, or in a hybrid setting. This goal required flexibility with the Google Suite of products, allowing teachers to embed and integrate the tools into whichever learning management system or whichever sort of content management organizing system that you want to use with learners. (This video provides an overview of their decision-making process in making their technology choices.) This not only sets up a consistent and predictable experience for learners but also allows other educators to easily reuse the resources they create.

Exhibit 4. Hubbs Center/St. Paul Adult Basic Education Skill and Technology Alignment Guide
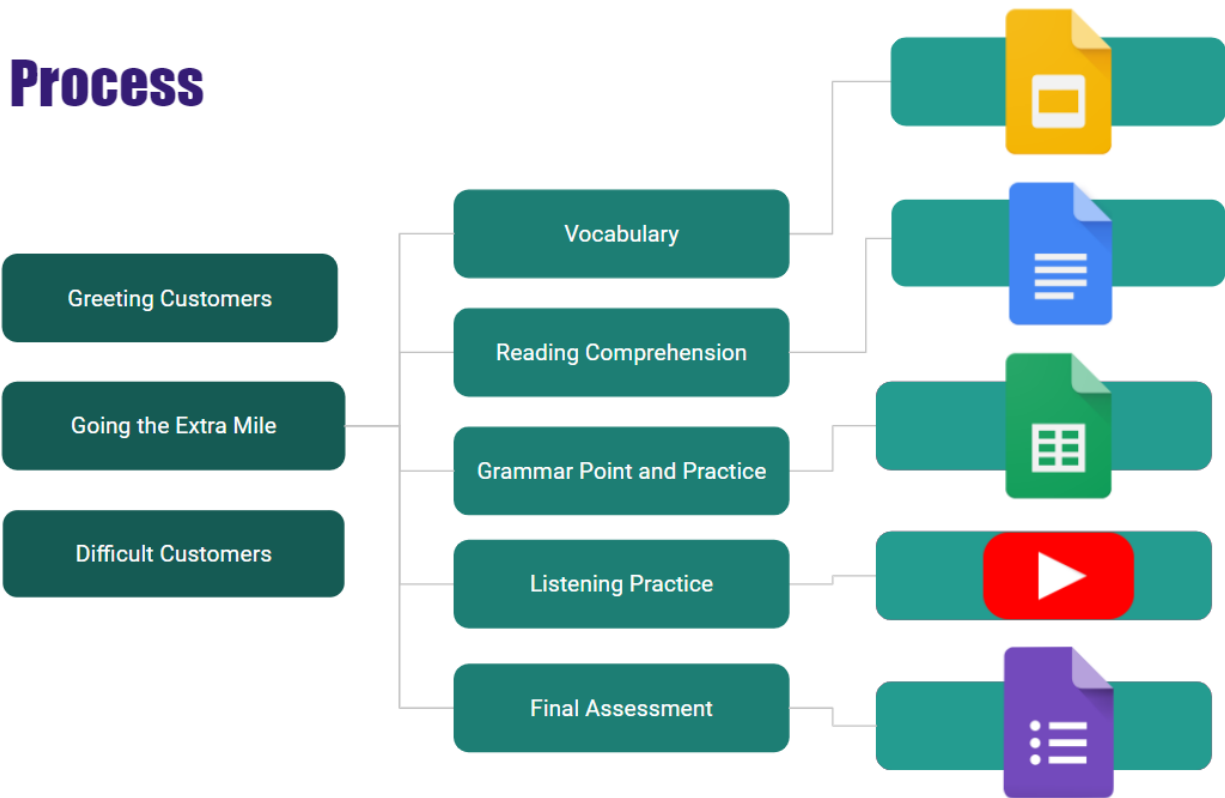
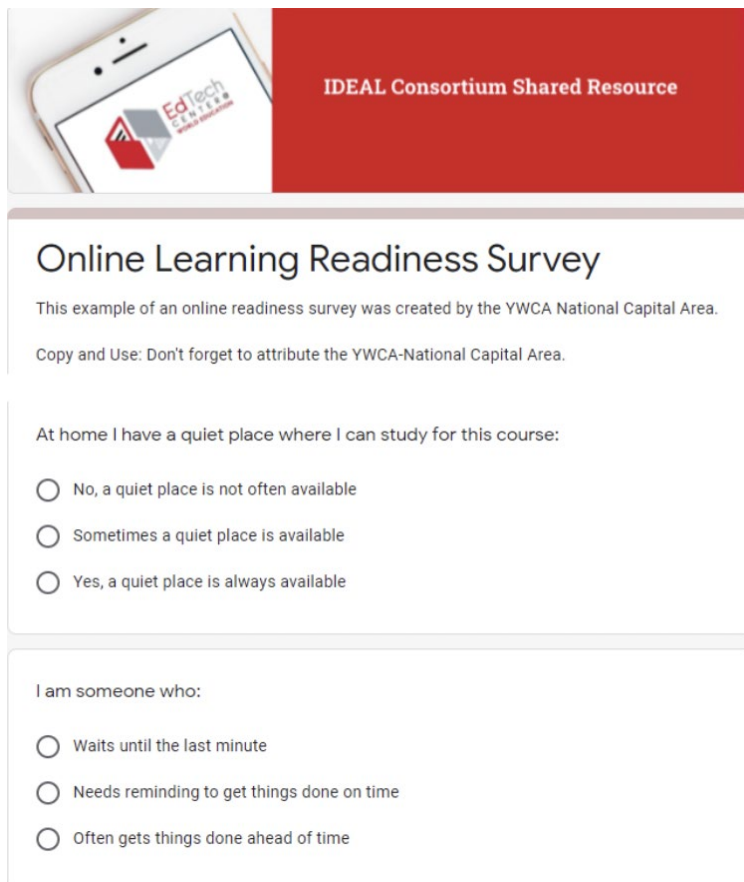*Note.* Based on the work of Klas and Tamale (2020).

Prioritize a Learner-Centered Approach Using Learner Questionnaires

A common understanding evident in the field is the importance of discerning learners' needs. Taking into account considerations such as access, skills, and learning goals can ensure that a program, course, or lesson design makes best use of the technologies available to convey instruction to a given audience of learners (Vanek et al., 2020).

Many adult education programs use questionnaires to better understand learners. These questionnaires can help programs objectively identify and address actual learner barriers rather than make decisions based on perceptions. For example, one program in Illinois assumed throughout the early months of the pandemic that their learners did not return because of a fear of learning online. When they issued questionnaires to their nonreturning learners, the program learned that many learners wanted to participate in online learning but could not because they lacked access to technology, not because they feared using it. Carlos Rosario International Charter High School in Washington, D.C., learned through a questionnaire that learners persisted because classes were offered remotely. There was more flexibility, and learners did not require a commute or need to find childcare so they could attend class.

Questionnaires also have been used to screen new students to define skills and support needs. Exhibit 5 shows an example of an online readiness survey developed by the Capitol Area YWCA in Washington, D.C. The series of online screening tools—which includes surveys for technology access, online learning readiness, and distance learning motivation—ensures that learners are set up for success.

Exhibit 5. Online Readiness Survey

Note. The survey was developed by the Capitol Area YWCA.

Promote Sharing and Collaboration

Prior research suggests that practitioners are more apt to turn to each other or to developers of technology than look to research for guidance on how to use technology in instruction (Price & Kirkwood, 2014). Throughout the pandemic, programs created opportunities for teachers to support each other (Vanek et al., 2021; *What we learned*, 2020). Through its CrowdED Learning initiative, the EdTech Center has prioritized helping teachers collaborate and share content through service learning opportunities, called EdTech Maker Space projects, that integrate professional learning into opportunities for teachers to collaborate and support resource creation and curation and to produce and share digital content to support specific curricula or instruction content areas. Teachers can not only learn how to use content creation tools such as Quizlet but also collaborate in the shared construction of activities that leverage open content. Rachel Riggs offered an EdTech Maker Space to teachers in Maryland; the example in Exhibit 6 is from this initiative, where teachers took the English as a Second Language (ESL) Story Bank and created sentence-building activities using Jamboard and typing practice using a tool called Flippity. A listing of these and other resources are provided in the appendix.

Exhibit 6. ESL Story Bank EdTech Maker Space

By working with teachers to help them learn how to use popular and effective educational technology tools, consider effective strategies for integrating these tools, have teachers co-create specific activities using these tools, and have teachers play an active role in helping increase the availability of effective digital learning resources.

Observations From the Field

These key strategies just described are evident in the work of the panelists who spoke during the session. **Cynthia Bell**, director of Workforce Development & Numeracy Services, LACNYC; **Rachel Riggs**, ESL instructional specialist, Frederick Community College; and **Neda Anasseri**, technology projects coordinator for the Outreach and Technical Assistance Network (OTAN) engaged in a discussion with each other and the meeting attendees. Their work, along with observations from attendees, is featured here to highlight instructional technologies and strategies and useful digital resources. There is a need for empirical research designed to explain exactly how, when, and for whom digital resources are relevant so that they might be scaled to impact more learners. Although each panelist offered unique perspectives based on their role and workplace, shared themes were observable throughout the discussion.

Goal-Driven Decisions About the Use of Digital Technologies

The roles and contexts in which each panelist works vary, representing program-level, citywide, and state-level work, but the panelists all share the responsibility for helping teachers make better use of digital technologies. They also share a similar approach in their guidance to teachers—encouraging them to establish goals or purposes to drive decision making about the use of digital technologies to support their instruction. The prioritized goals they noted in the session included addressing accessibility and access, minimizing cost and inconvenience, and supporting engagement.

Strive for Accessibility and Access

Each panelist shared the view that accessibility and access was a primary consideration when using digital resources and tools. To meet accessibility demands, the panelists agreed that the design of resources and tools needs to be useful to as many learners as possible; that is, resources must meet 508 compliance requirements and be shaped by the Universal Design for Learning framework. They also agreed that access means designing instruction for use on mobile devices**.** Only about half of the households earning less than $30,000 per year have a computer (Anderson & Kumar, 2019), and 27% of the adults in those households are smartphone only (Perrin, 2021). Therefore, to support broad access, programs need to look for mobile friendly tools for content delivery, communicating with students, and assessment. The panel also recommended that programs deliver PD through mobile technologies so that teachers can understand learner experience.

An additional approach to support access is using digital platforms with which learners already have some familiarity. An example is [WhatsApp](#), an application that many learners use to communicate with friends and family. Teachers across the country use WhatsApp to stay in touch with learners, provide support, and even deliver digital instructional content.

Adopt Digital Technologies That Minimize Impact on Learners

The cost of licenses and devices was noted as a barrier to digital technology adoption, along with the "time cost" of onboarding teachers and students to multiple tools. Rachel Riggs observed that tools serving multiple purposes or can support seamless integration options are desirable because teachers can deepen expertise and comfort using fewer technologies, and students can focus time and energy on learning content rather than on how to use multiple technologies to engage in learning. All panelists recommended finding tools that are easier to use because they require merely transferring skills garnered through the use of other technologies. Another critical aspect is finding tools that are easily integrated into those already in use. For example, apps that link to a Google log-in can be especially useful because they ease transitions between different technology tools used in instructional activities and minimize the need for learners to track multiple usernames and passwords.

Engagement

Each panelist noted the importance of engagement, specifically engagement technologies that support collaboration and making connections. Collaboration affordances support problem-based or project-based learning that draws on technology use to mirror use in both the workplace and daily life. Collaboration and engagement support developing transferable skills that learners can use beyond the classroom. Also important is the extent to which a technology tool supports building connections among peers and with instructors that can help learners feel as if they are in a supportive learning community.

Digital Technologies for Connection and Collaboration

Several examples of tools that support engagement were mentioned. Digital whiteboard tools (e.g., Padlet and Jamboard) were noted for their utility in supporting synchronous collaboration and connection, which can result in a learning object for later use. Neda Anasseri recommended Flipgrid, a threaded video discussion app used by teachers in California, as an alternative to online discussion that allows students in English to Speakers of Other Languages classes engage in oral language activities.

Google applications, such as Slides, Sheets, and Docs, are a means to support collaboration among groups of learners and teachers. Cynthia Bell told attendees that LACNYC uses Kami, an online document annotation tool, integrated into Google Drive and Google Classroom to support collaborative reading. LACNYC also uses Desmos, a mathematics instructional tool, that includes a graphing calculator and a scientific calculator along with free digital activities that promote mathematical learning through an exploratory approach that emphasizes collaboration and problem solving.

Challenges Faced Using Digital Technologies in Instruction

Each panelist described challenges helping other teachers and learners integrate digital technologies into teaching and learning. Some noted challenges included the confidence of teachers, overwhelming teachers with the number of tool options suggested and shared, designing instruction to meet needs of learners, and the provision of access and support.

Building Confidence of Teachers

Helping teachers overcome a lack of confidence in using technology was a shared challenge. Cynthia Bell noted that LACNYC needed to move teachers outside their comfort zones to try new tools or use a familiar tool in new ways. LACNYC addressed this issue by providing individual and small-group coaching and employing individualized professional development plans (IPDP) for teachers, strategically working with them to build skills and confidence. Measuring progress on IPDPs is linked to program-level quantitative data (e.g., retention rates) and qualitative data (e.g., classroom observations, teacher reflection). To meet their IPDP requirements, teachers participate in targeted workshops and coaching. Bell reported that this process was effective in helping teachers transition from using no tech in the classroom to fully teaching online.

Avoid a Tech Free-for-All

Although the panelists were encouraged by teachers' adoption of technology, they noted that taking on too many new digital technologies also can be problematic. Rachel Riggs described an ad hoc approach to the selection of technology tools in the early days of the pandemic, which resulted in stretching staff and learner capacity to use any of them too thin. As time passed, however, they shifted to using frameworks to provide structure for limiting tool selection, employing only those that were most effective and accessible. They leveraged the LACNYC's *7 Elements and 3 Practices* framework to guide technology choices for synchronous instruction. Riggs appreciated how the framework helped teachers determine whether they have "a complete 'kit' of technology to address different areas of synchronous instruction." She also said that CrowdED Learning's Teacher Tools webpage and implementation plan template and the Tech Tool Evaluation Rubric by the EdTech Center were resources that can guide programmatic decisions about which tools to promote.

Designing Instruction to Really Meet the Needs of Learners

A common problem early in the pandemic was that teachers new to live remote instruction tried to replicate, without modification, instructional strategies that worked in person. The result was unengaging instruction, characterized by too much lecture and too little personalization, with learner engagement limited to synchronous whole-class instruction within the video platform they used. Neda Anasseri described how teachers discovered the need to start thinking outside the box. As both teachers and students grew more comfortable being online, and video conferencing platforms developed affordances to support engagement, they gained confidence in using breakout rooms to begin differentiating instruction. They could then layer in additional technologies to vary activities according to individual student needs while in the remote live classes. This independent study model worked well for many of the programs that OTAN supports.

A second challenge in this area was the provision of accessible resources. One attendee, Debra Hargrove, Texas A&M/TCALL (Texas Center for the Advancement of Literacy & Learning), volunteered that TCALL stepped up its provision of technical assistance on the topic and directing one staff person to focus solely on technical assistance for accessibility. She created an Accessibility Plan for TCALL with the goal of providing proactive assistance to boost teacher capacity to create and deliver accessible online instruction.

Providing Technical Support

Closed buildings and mandated social distancing posed a problem for the delivery of technical support while instructors tried to bring in more digital technologies to support instruction with learners, many of whom had only nascent digital literacy. Rachel Riggs noted that some programs needed to deliver some in-person technical support that followed COVID-19 safety protocols because it was too difficult to onboard some students to digital learning tools over Zoom. The in-person sessions, of short duration, emphasized the digital skills building that learners needed to continue learning online. Use of a learner's home language can facilitate this process. Teachers, too, needed some safe opportunities to gather in person to collaborate and experiment with new digital tools. This PD often focused on mobile-friendly teaching, requiring teachers to try out tools on their own phones, so that they could better provide guidance to learners who struggled remotely.

A technical support strategy recommended by OTAN was keeping track of support services delivered to better anticipate the provision of PD. Many agencies in California have "tech teams" that use forms to log support provision activities and device inventory. They then use the data to anticipate where more proactive training would be useful. For example, programs noticed that logging in to apps that used single sign-on with email accounts was challenging for learners with multiple email accounts. Proactive support through online screen sharing in breakout rooms helped students who were unfamiliar with navigating between different accounts.

Access and Digital Skills

All panelists and several session attendees emphasized the challenge of learners impacted by digital inclusion barriers: the lack of digital devices, limited to no internet access, and limited digital skills. To solve access issues, some programs loaned devices to teachers and students; others applied for grants to purchase devices for students. A common approach to mitigating digital skill gaps was to offer "tech boot camps" to both teachers and students. Others noted the importance of selecting and deploying technology tools and resources that align with the current digital skill sets of learners so that the use of new technologies is not a barrier to learning and current knowledge serves as an on-ramp for using new technologies. Once a technology tool is selected, ensure ample support to onboard learners; this support ensures that learner focus remains on enhancing and expanding learning content, not just learning how to use another digital tool.

Funding/Policy Constraints

A final challenge evident in the discussion was about funding and policy constraints. One attendee chatted about the need to advocate for state funding to support technology-rich, multimodal instruction, noting state-level pressure to streamline offerings by getting back to classrooms and limiting distance education to a narrow set of specific curricula. They noted the importance of leveraging lessons from the pandemic to craft policies that make clear how new, more flexible modalities (e.g., the hyflex model) should be implemented. Another attendee suggested that state and federal guidelines for reporting on distance education need improvement to better measure learning gains.

Moving Forward

The pandemic serves as a test of the capacity of programs, teachers, and learners to engage in new ways of teaching and learning through digital technologies. Although empirical research is needed to fully understand the impact on the field, some of the innovation and new ways of teaching are worth sustaining. Some geographic limitations of providing instruction in classrooms have been blurred, leading to new ways of teaching and learning. Some students and teachers will prefer to remain online. Given that many programs have fully integrated some digital technologies into routines, going back to the teaching that existed before the pandemic would likely cause even more disruption. In addition, educational technology developers have risen to the occasion, releasing updates more quickly and boosting the provision of technical support, making it easier to use many products and resources. Cynthia Bell said that LACNYC does not want practitioners to go back to old ways of instruction; the goal is to take the best of their new ways of working back into the classroom. Bell hopes that the PD provided in the past year lays a foundation for support for using tools (e.g., Desmos) to enhance engagement, connection, and collaboration for in-person instruction. Bell also suggested that LACNYC will integrate the use of digital technologies more strategically in future PD workshops.

There are benefits to sustaining the momentum about the use of digital technologies. Neda Anasseri said that the focus on educational technologies has buoyed everyone's digital literacy skills, with both teachers and students saying that they developed transferable skills to use for work and navigating online systems. The potential for the continued use of technologies also extends to PD for instructors. Rachel Riggs talked about how their teachers became content and curriculum creators, imagining new ways of using different tools. Anasseri also acknowledged that teachers are creating more content to meet the needs of their learners. In response, OTAN offers training on licensing and creating content through Creative Commons and on how to create accessible 508-compliant documents, slides, and videos to provide equal learning experiences.

Conclusion

The key impact of the pandemic has been a drastic acceleration by instructors to learn about and adopt digital technologies, resulting in their widespread use in adult education programs across the United States. The session presented the characteristics of the landscape of this use. The information shared signals potential areas for future research, with the goal of exploring current understandings to produce actual evidence gleaned from empirical research that can inform scaling innovation.

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Appendix. Digital Technologies Referenced

Articulate
https://articulate.com/

Articulate Storyline 360
https://articulate.com/360/storyline

BEST|Screening for Success
https://docs.google.com/document/d/1bIGsIFZ_l3WeuudXBq9rPpQQn5ZUCFB5tGYo2RcjG0o/edit#heading=h.fytcr14h15h6

Canvas
https://www.instructure.com/canvas

CrowdEd Learning's Teacher Tools
https://www.crowdedlearning.org/explore/teacher-tools

Desmos
https://www.desmos.com/

Digital Equity Fact Sheets
https://www.nationalskillscoalition.org/resource/publications/digital-equity-for-an-inclusive-economic-recovery/

Digital Promise Adult Learner Model
https://lvp.digitalpromiseglobal.org/content-area/adult-learner/factors

EdTech Integration Strategy Toolkit
https://etctechtoolkit.glideapp.io/

EdTech Maker Space
https://www.crowdedlearning.org/our-work/etms

Khan Academy
https://www.khanacademy.org/

Flipgrid
https://info.flipgrid.com/

Flippity
https://www.flippity.net/

GCFLearnFree
https://edu.gcfglobal.org/en/

Google Apps
https://workspace.google.com/

Google Classroom
https://classroom.google.com/

Google Jamboard
https://jamboard.google.com/

Google Sites
https://sites.google.com/

Integrating Google Applications on a Weebly Site
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