

# Building Knowledge and Evidence About Using Digital Technologies in Adult Foundational Skills Programs

## A Center for the Study of Adult Literacy Convening Paper

Judith A. Alamprese, Principal Scientist, Abt Associates

Recent activities and events spurred adult educators' interest in digital technologies, including the Barbara Bush Foundation Adult Literacy XPRIZE competition; the development of digital products by adult education publishers; and the COVID-19 pandemic, which prompted adult foundational skills programs to shift from in-person classes to virtual instruction. As interest in digital technologies grows, the need for information about how to implement these technologies and what works for whom under what conditions also grows.

Although some form of technology has been used to teach adult foundational skills for at least 3 decades,<sup>1</sup> the knowledge base about the implementation and effectiveness of technology with adult learners is limited. The recent expansion of technology use in adult foundational skills programs suggests the need for increased efforts to develop knowledge and evidence about the types of technologies and tools that can be used effectively to assist adult learners in enhancing their foundational skills and facilitating their lifelong learning.

To stimulate thinking on this topic, the final convening of the U.S. Department of Education's Institute of Education Sciences (IES)-funded Center for the Study of Adult Literacy (CSAL) included a session titled "Building Knowledge and Evidence about the Use of Digital Technologies in Adult Foundational Skills Programs." The session began with Judith Alamprese presenting an approach to building knowledge that considers the stages of development and the use of digital technologies. What types of research and evaluation questions may be helpful to investigate? How can we understand how technology is used, and what are technology's effects on students' learning? How can we explore the range of study designs and data for addressing questions about the various stages of technology development and use?

Next, to illustrate the range of stakeholders who have a role in building knowledge and evidence on the use of digital technologies, the session featured a panel of interviews with adult educators from the state and local levels who shared the questions they would like to answer about technology use with adult learners, the types of data they have and would need to collect to address those questions, and the assistance they would need to analyze data. These adult educators represented the Arizona Department of Education (Sheryl Hart), the Texas Center for the Advancement of Literacy & Learning (TCALL) at Texas A&M University (Debra Hargrove), and Houston Community College (HCC; Jeannie Hale). The goal was to stimulate the interest of adult education stakeholders in understanding where we are in the use of digital technologies; what we can learn about implementing technology from the experience of programs, particularly during the COVID-19 pandemic; and how we can think about building stronger collaborations among practitioners, policymakers, and researchers to build knowledge and evidence.

---

<sup>1</sup> For example, early studies included the following: Askov et al. (1986), Rachal (1993), and McCain (2009).

## **Approach to Building Knowledge and Evidence on Digital Technologies**

---

One motivation for the session on building knowledge and evidence is the expanded use of digital technologies in adult foundational skills programs. In a relatively short period of time, most adult skills programs transitioned to incorporating some digital technologies to provide services to adult learners, including instruction. The increased use of technology suggests that this is a critical time to understand what is happening in technology use in these programs, particularly if we want to build a pipeline of promising practices for rigorous evaluation.

The existing research literature on technology use with adults is primarily from higher education and reflects an international interest in the topic, with most evaluations coming from the United States, the United Kingdom, Australia, and China, along with a growing number of studies from Europe and Taiwan. An international perspective can enrich the way we think about technology use and the types of study designs that might be implemented, particularly those involving both outcome and implementation data, so that one can understand the types of activities that lead to learner outcomes.

Finally, knowledge building is a collaborative endeavor, and the use of digital technologies is a topic that interests researchers, practitioners, and policymakers. The use of collaboration is illustrated in work funded by IES and other entities. It is challenging to implement a well-designed study without the active involvement of instructors, administrators, and learners. In addition, how to do this well is a challenge that many of all roles are striving to overcome together.

### **The Pipeline of Developing and Adapting Digital Technologies**

---

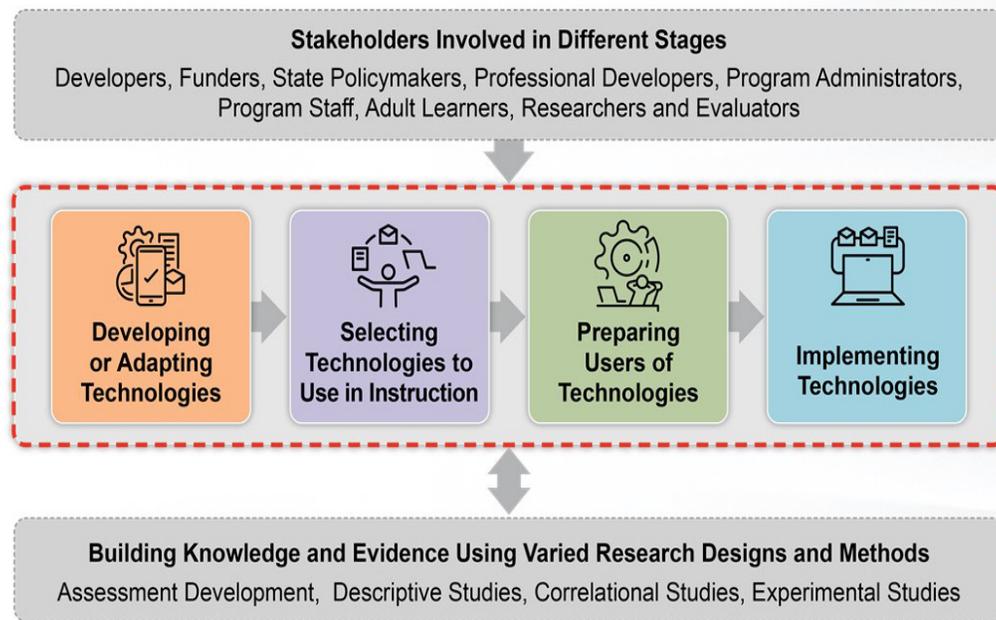
Three main sources support a pipeline of developing and adapting technologies for use with adult learners. One source is IES grants, as illustrated in the work undertaken in the CSAL project. IES grants often involve many stakeholders and are researcher-initiated studies. Through an iterative process, IES development grants can result in new products that are then tested and rigorously evaluated in follow-up studies. Philanthropic organizations are another source of funding, and those studies often are developer-initiated activities. Some developers integrate data collection in their technology tools and work with evaluators to conduct external evaluations of those tools. A third source is the work of adult educators who adapt tools and materials for use, with whom they use the tools and materials, and how they blend online tools with other types of materials. These practitioner-initiated activities often involve the collection of learner outcome data to meet state or federal funding requirements. This information about the pipeline is helpful in thinking about what other sources of technology development or adaptation are available, the stakeholders involved, and the range of data collected. It also raises awareness about the quality of data collected, what steps can be taken to improve the data collected, and how stakeholders can access high-quality data collection instruments.

### **Stages of Development and the Use of Digital Technologies**

---

One approach to building knowledge about technology is to think about the various stages that lead to the use of technology, beginning with the development and adaptation of tools that support learning in adult skills programs, the processes that staff use to select tools for instruction and related activities, how staff and students learn to use the technology, the processes that staff use to implement technologies, and the various questions asked about each stage. Exhibit 1 is a streamlined illustration of the relationships among key stakeholders interested in using technology, the stages of technology development and implementation, and the varied research designs and methods used to answer questions about the activities involved in each stage.

## Exhibit 1. Stages of Development and Use of Digital Technologies



Note. Created by Judith A. Alamprese; used with permission.

However, Exhibit 1 does not capture the interaction between different designs, the types of questions investigated, and how they are answered in those different stages. Other factors that are important to consider when thinking about the types of research to conduct are the processes used to select technologies and preparing users of technologies to implement those technologies.

### Questions Guiding Knowledge Development

It is helpful to think about what types of questions researchers can ask to develop knowledge at each stage of technology development. How technology tools are used with a range of target populations of learners is a key question because learners come to the programs with different backgrounds in their use of technology, and some programs have a limited budget or access to different technology tools.

In examining the **development or adaptation of technologies**, it is important to ask questions about the target population for using technology tools, the functional adequacy of the technology tools, the conditions under which the tools can be used optimally, and whether the technology tools also address the content to be taught. It also is useful to know to what extent pilot tests of new tools have been conducted, what the results were, and how the results indicate any next steps needed in the further development of the tools. For example, CSAL's work on the AutoTutor illustrates how well-designed development and testing of a tool can lead to next-stage development and further testing of a tool.

**Selecting the technologies** for instruction is a stage—or process—that requires substantial thought and consideration. Examples of important questions to answer when selecting technologies include the following:

- Does the technology tool align with the knowledge and skills that learners need to master?
- What is the adequacy of the technology infrastructure to support the use of technology tools?
- How does technology content align with other types of instructional materials being used for that target population?
- What is the availability of professional development (PD) to prepare staff and learners?

Technology selection tools incorporate these factors. These factors and possible research questions can be addressed through descriptive studies or in more complex designs involving correlational analyses in which the relationships among the extent of the alignment, the extent of the adequacy, the content addressed by the tools, and learner outcomes from using those tools can be examined.

The process for **preparing users of technology** is central to adult educators' and learners' effective use of technology and is a critical area for knowledge development. The COVID-19 pandemic reinforced the need to know the extent to which learners' and instructors' technology skills are adequate for using the technology tools selected for instruction. It also raises the question whether different measures of technology skills are needed to determine whether they can successfully use the technology. Another important area to examine is whether the types of training provided to prepare learners to use technology tools is adequate. There is a range of training for learners being conducted, which suggests an opportunity to develop measures of the adequacy of training, examine the types of training frameworks available, and compare those frameworks with empirically developed frameworks. Similar information is needed about the types and adequacy of PD provided to instructors and the extent to which instructors follow the guidance provided. An overarching question is whether the available PD frameworks for preparing instructors and other staff to use technology tools are used and whether their use results in student learning.

The final stage is **implementing technology**. It is critical to understand how instructors and learners use the technology they have been trained to implement, particularly in terms of their perceptions about the utility of the technology and whether the technology helped learners in developing their skills. Information about the implementation of technology can help inform the previous stages of technology development, selection, and preparation for use. Questions to ask in developing knowledge at this stage include the following:

- What types of barriers are encountered in using technology?
- What were learners' perceptions of the helpfulness of the technology tool in developing their skills and knowledge?
- To what extent did learners develop their skills and knowledge from using the tool?

A range of study designs will help answer these questions.

## Considerations in Building Knowledge

---

The stages of development and the use of digital technologies provide a framework for identifying the types of research questions for each stage and knowledge and evidence that can result from studies addressing those questions. There also are considerations in developing knowledge on the use of technology tools to help plan possible research activities.

A key consideration is the **assumptions** about learners that developers and staff make in creating or adapting technology tools and their expected outcomes from using those tools. In planning research on the outcomes from using technology tools, it is important to know the intended target population for the tool, the assumptions that the developer or staff have made about learners' use of the tool, and the skills that learners bring to the environment in which the tool will be used. Other factors to consider are what the tool will demand of learners and how they will use it to be successful. This information can be helpful in developing a theory of change for an outcome study on the use of technology tools.

Another consideration is the **variety of technology tools** being used and the implications for structuring knowledge about those tools. The range of available tools suggests a need to develop a typology of technology tools for adult learners in foundational skills programs as an initial step toward building knowledge about their use and possible effectiveness.

**Learners' engagement** in using technology tools is an important factor in using technology for instruction. Instructors need more information about learners' willingness to use technology tools, the barriers to their use, and their ability to generalize their skills from one type of tool to another. This information could help guide foundational skills program staff in developing supports for learners' use of technology tools. The role of learners' engagement also suggests that researchers should include measures of learners' engagement in using tools as a possible mediating variable affects their outcomes.

Finally, a range of knowledge is needed to understand current practices with technology tools and their effectiveness. This knowledge has implications for the **types of research designs that might be used, the types of data to collect, and the cycles of studies** needed to answer the questions of interest. One approach is to consider organizing research studies according to the stages of technology development and use (see Exhibit 1) or another paradigm that would enable studies to build on one another and result in a substantial base of knowledge and evidence about technology use with adult foundational skills learners. Having multiple studies focused on key research questions of interest would help advance both the knowledge and the services provided to adult learners who use technology tools.

## Policymaker and Practitioner Priorities for Building a Knowledge Base

---

After the featured presentation, Judith Alamprese interviewed each panelist about how they support adult learners' and adult educators' use of digital technologies and the research questions they would like to explore. The panelists discussed the data they could access to answer their research questions, the outstanding data that would need to be collected, and the assistance they would need to access and analyze those data. The interviews illustrated policymakers' and practitioners' interest in research and how collaboration among researchers, policymakers, and practitioners could help expand the knowledge and evidence base about technology use in adult foundational skills programs.

## Use of Blended Learning in Adult Education Programs

---

Sheryl Hart, a deputy associate superintendent and the adult education state director at the Arizona Department of Education, was the first panelist. Ms. Alamprese interviewed Ms. Hart about her interest in understanding the effects of the COVID-19 pandemic on the use of blended learning in Arizona's adult education programs.

### ***Approach to Blending Learning***

Prior to the COVID-19 pandemic, Arizona's adult education state office (hereafter, state office) required adult education programs to implement blended learning to increase access to adult education for learners who had difficulty regularly attending in-person classes. The state office defined blended learning as the delivery of adult education programs through a combination of face-to-face instruction and proxy hours online that learners could log on to the online programs that the state office supported (i.e., BurlingtonEnglish, Odysseyware, EdReady/The NROC Project). Programs also could use Arizona's Teacher Verification Model (TVM). In the TVM, the state office trains and approves adult education instructors' development of lessons with asynchronous components and assigns the number of proxy hours that can be counted for the lessons. The TVM lessons generally include a variety of online materials and assignments, such as YouTube videos and teacher-recorded lessons. During the pandemic, the state office modified the TVM policy to allow the use of print-based packet activities in addition to online activities to accommodate the needs of adult learners who had difficulty accessing technology.

The pandemic prompted the state office to revise the blended and virtual/distance learning policy to include both synchronous online classes and asynchronous online learning options. The TVM provides adult education instructors with flexibility in selecting programs and materials, and the number of lessons in the TVM repository increased from 75 lessons at the beginning of the pandemic in March 2020 to 1,500 lessons by July 2021. This increase suggests that a variety of online programs and materials have been used for instruction in adult education programs during the pandemic. Although enrollments in adult education programs decreased since the pandemic began, the programs maintained learners' involvement using blended virtual learning modalities.

### ***Research Questions About the Use of Blended Learning***

The state office desires to have more detailed information about learners' participation in adult education programs since the pandemic began. In particular, the state office staff wants to explore the following questions:

- What are the demographic and background characteristics of learners who participated in adult education programs during the pandemic?
- How much time were learners engaged in learning?
- What types of programs and materials engaged learners?

Because adult education programs had difficulty implementing pretests and posttests during the pandemic, learners' basic skills outcomes, as measured by standardized basic skills tests, the state office had no data (for 18 months) on the basic skills of adult learners. However, research questions about who participated, the types of instruction they received, and the amount of instruction they received can be explored. The state office would like to use this information to determine the types of policies to consider for synchronous and asynchronous online learning.

### ***Availability of Data to Address Research Questions***

The state office maintains a data management system for adult education that includes most of the data needed to address the research questions regarding learners' background characteristics and participation in adult education. Information on learners' demographic and background characteristics is collected when learners enroll in an adult education program. Their participation data include how much time they spend in synchronous and asynchronous online instruction and the class(es) in which they participate. Classes are organized in the data management system under the category of blended learning, and the system records attendance in three categories: face-to-face hours for synchronous live instruction when the teacher and learners are in the same physical space; instruction-at-a-distance for

synchronous live instruction when the teacher and learners are not in the same physical space; and proxy for learners doing asynchronous instructional activities using the Clock Time Model, the Learner Mastery Model, or the TVM.

Information on the content of instruction is in the data management system's record on learners' participation in asynchronous online learning, which records learners' usage of the three online platforms that the state office supports. The curricula on these platforms provide auditable usage or attendance reports at the learner level to document the proxy hours for attendance entered in the data management system. TVM forms for the asynchronous courses that instructors developed describe the specific online programs and other materials that instructors used in their courses.

The content of instructors' synchronous courses is currently not documented and would need to be collected by surveying instructors. This information could be used to compare the content of the synchronous and asynchronous learning activities.

### ***Assistance Needed to Collect and Analyze Data***

The state office would require assistance in coding the instructional activities on the TVM forms to identify the different types of programs and materials used in asynchronous learning and in coding data from a survey of instructors about the content of their synchronous instruction. Assistance also would be needed to analyze the relationship among types of learners, the attendance levels, and the types of synchronous and asynchronous learning undertaken.

### **Professional Development for Leads for Distance Learning**

---

Debra Hargrove, managing and communications director of TCALL at Texas A&M University, was the second panelist. Ms. Alamprese interviewed Dr. Hargrove about possible research related to PD for the Leads for Distance Learning (DL Leads), who work in adult education programs in Texas.

### ***Background About the DL Leads***

The Texas Workforce Commission, which funds adult education programs in Texas, recently approved the position of DL Leads to guide program distance learning, digital literacy, and other educational technology efforts. The funding of the DL Lead position provided an opportunity for TCALL, which is supported by the Texas Workforce Commission, to provide PD to adult education program staff and engage the DL Leads in networking and sharing best practices. TCALL's goal is to assist the DL Leads in acquiring tools and technologies that they could share with their distance learning and hybrid or remote instructors. The COVID-19 pandemic showed many adult education programs that their instructors did not have the tools and training necessary to implement successful distance learning.

TCALL's approach to equipping the DL Leads leveraged the [Digital Literacy Framework from Maryland](#) to ensure that the DL Leads had the core knowledge and skills to integrate technology and train instructors. Although the DL Leads liked the framework, TCALL staff were unsure if the DL Leads were fully implementing it in their work with instructors.

To address this issue, TCALL revisited the Tech Integration Coach (TIC) program, which TCALL previously implemented, to determine whether the TIC materials could help the DL Leads improve their skills in working with instructors to integrate technology. The TIC was an online competency-based program with a framework that incorporated the International Society for Technology in Education standards. TIC includes several levels of proficiency that participants had to demonstrate to receive a digital badge. Participants became a Certified TIC when they completed all levels.

After reviewing the TIC program, TCALL realized that the DL Leads would not have time to participate in the number of modules required at each TIC level. Accordingly, TCALL would like to develop a less extensive version of TIC for the DL Leads. To determine the content of the refined TIC, TCALL will conduct a survey of the DL Leads to find out what assistance they provided to instructors during the past program year, what challenges they encountered in their coaching, and what information or skills they need to be effective DL leads.

After the survey is conducted, TCALL will compare the needs of the DL Leads to the current requirements in the TIC program to align the refined content to the current needs of DL Leads. TCALL hopes to implement this by winter 2022.

### ***Research Questions About the Refined TIC Program***

TCALL would like to explore the following questions about a refined TIC program for the DL Leads:

- How much support do DL Leads receive from adult education program directors in implementing the TIC program in terms of the
  - amount of time they can work on the TIC program,
  - amount of time they can provide training and assistance to instructors in integrating technology, and
  - barriers they encounter in implementing the training and assistance?
- To what extent do instructors participate in the TIC program and use its materials?
- To what extent do instructors improve their integration of technology in their teaching?

### ***Availability of Data to Address Research Questions***

TCALL is considering a pilot test of the refined TIC program to determine whether the program meets the needs of DL Leads. In conducting a pilot test, TCALL would collect new data on DL Leads' implementation of the TIC program. For example, TCALL would need to know whether the DL Leads work with instructors in groups or individually. If the DL Leads work with groups of instructors, TCALL could set up virtual observations of the group sessions to track the technology integration strategies that the DL Leads use with instructors and provide feedback to the DL Leads based on the observations. TCALL also might ask the DL Leads to maintain coaching logs to indicate what assistance they provide to instructors and the issue(s) they addressed in providing that assistance. Another type of data that TCALL could collect is to interview the DL Leads about the challenges that instructors encountered in the using the TIC program and how they assisted instructors in addressing those challenges. Alternatively, TCALL could give the DL Leads an example of a challenge that an instructor might encounter in integrating technology and ask the Lead about what advice they would provide to the instructor. The information the DL Leads provide from either data collection method would inform TCALL about how the DL Leads apply the strategies from the TIC program.

### ***Assistance Needed to Collect and Analyze Data***

TCALL would benefit from having a researcher review the draft survey for DL Leads for collecting information about the assistance DL Leads provided to instructors during the past program year, the challenges they encountered in their coaching, and the information or skills they need to be effective DL Leads. TCALL also could benefit from assistance in determining the optimal data collection methods for assessing whether the DL Leads use the strategies they learn from the TIC program and whether instructors improve their integration of technology in instruction.

## Participation and Completion Patterns of Subgroups of Learners in Integrated Education and Training Programs

---

Jeannie Hale, program manager for Workforce Initiatives, Partnerships, & Research at HCC, was the third panelist. Ms. Alamprese interviewed Ms. Hale about possible research on adult education learners' participation in HCC's Career4U Academy (hereafter, Academy), a program offered by HCC's Adult Education & Literacy Department.

### ***Overview of the Career4U Academy***

The Academy is an integrated education and training program for adult education learners that focuses on high-demand occupations in five industry sectors: business technology, construction, healthcare, information technology, and transportation. There is an Academy for each high-demand occupation, and each Academy has approximately five to seven academic programs that require similar skills within those sectors. The Academy provides instruction in three components of services in which learners participate simultaneously—workforce training, contextualized adult education and literacy (AEL), and workforce preparation. After learners complete the Academy's three components, they receive a college- and state-recognized Level 1 certificate. HCC's Adult Education & Literacy Department partners with HCC's CareerHub to support learners seeking employment.

The Academy's workforce training follows a standard syllabus based on the industry program that is the focus of the training. AEL learners attend workforce training courses offered at HCC along with HCC postsecondary learners. The training programs use various modalities: in person, online, synchronous, asynchronous, and hybrid. For the AEL component, learners participate in a synchronous contextualized support class that focuses on basic skills to help them obtain and retain employment in their industry of choice. The Edmentum platform provides asynchronous learning and reinforcement of adult basic reading, writing, and mathematics skills for that same industry. English learners (ELs) receive additional asynchronous English language instructional support through the BurlingtonEnglish platform. Both basic skills and English language support classes are contextualized to the content of the workforce training. For the workforce preparation component, learners participate in an HCC-developed career readiness class and complete online virtualjobshadow modules as part of their AEL support class. Learners also participate in job search seminars hosted in partnership with Workforce Solutions, which serves the public workforce system in the Houston-Galveston region of Texas.

### ***Research Questions About the Career4U Academy***

One topic of interest is whether ELs and basic skills learners completed their Academy programs at the same rate during the COVID-19 pandemic. Because the Adult Education & Literacy Department collects a range of demographic and background data about learners when they enroll, analyses of the relationships between learners' background characteristics and their persistence and completion rates in the Academy could be explored. For example, information about Academy learners' family structure and employment status is collected when they enter the Academy. These data could be analyzed to determine whether Academy learners with school-age children or those who were employed in one or more jobs at the time of their enrollment were less likely to persist or could not complete their program compared with learners without those constraints. Analyses of the relationships between learners' levels of basic skills and English language proficiency at enrollment and their persistence and completion rates also could be conducted. These analyses could help the Academy determine whether learners need additional academic and/or nonacademic supports, and whether basic skills learners and ELs need different types of supports.

Research questions that would be of interest to explore are as follows:

- Do basic skills learners and ELs persist at the same rate in the AEL asynchronous reinforcement platform (basic skills instructor and EL instructor) and in the synchronous courses (the support class) that comprise the AEL component of the Academy?
- Do basic skills learners and ELs complete their Academy program at the same rate?
- Do basic skills learners and EL background characteristics at enrollment in the Academy predict their persistence and completion rates?

Another topic of interest is AEL learners' (both basic skills and ELs) rate of completion of the workforce training component of the Academy. AEL learners participate in HCC's workforce training courses along with HCC's postsecondary learners who have enrolled in those courses. Because Academy learners receive additional academic preparation that includes occupationally contextualized instruction and employability skill training, Academy staff assume that AEL students should be able to succeed in the workforce training courses. The following questions could be explored to test this assumption:

- To what extent do Academy learners complete the workforce training courses in which they enroll?
- Do Academy learners enrolled in workforce training courses complete those courses at the same rate as postsecondary learners who enroll in the same workforce training courses?

The responses to these questions could help Academy staff determine the need for additional supports for Academy learners to bolster their participation in the occupational training.

### ***Availability of Data to Address Research Questions***

Academy staff can access the learner data that HCC's Adult Education & Literacy Department collects for their funder, the Texas Workforce Commission. Those data are learners' demographic and background characteristics, the Tests for Adult Basic Education pretest and posttest scores, and attendance data. The online instructional programs used in the Academy—Edmentum and BurlingtonEnglish—also provide data on learners' beginning educational functioning level and progressions made through posttests. HCC provides Academy learners' completion data and Level 1 certificate attainment data based on learners' occupational courses.

Other learner data available include letter grades or completed or incomplete status for noncredit courses. Academy staff can access data from HCC's Office of Institutional Research for postsecondary learners who participate in workforce courses but are not enrolled in the Academy. These data are learners' demographic characteristics, attendance, workforce course completion, and Level 1 certificate attainment.

### ***Assistance Needed to Collect and Analyze Data***

Because the Adult Education & Literacy Department does not employ a data analyst or a statistician, Academy staff would need assistance from HCC staff to review the research questions to be answered, download the learner data related to these questions, analyze the data, and review the results.

Academy staff have begun work with the Office of Institutional Research to explore some of these questions and hope to continue their work with the office.

## Moving Forward

---

Participants at the convening considered the following question: What else would you add to the types of information to be considered in building knowledge and evidence about the use of digital technologies in adult foundational skills programs? Participants' responses can be categorized into four types of information, as follows:

- How technology can improve the operation of foundational skills programs and the participation of instructors, staff, and learners
  - How programs committed to racial equity can work to ensure that technology use in adult education helps narrow equity gaps rather than reify or widen them
  - The contextual elements that best support effective technology-enabled instruction, such as funding, staffing, PD, policy, access to technology, and communication strategies
  - The role of tutors in expanding the use of technology to support instruction
  - How learners' expertise in using technology can enhance the use of technology in adult foundational skills programs (e.g., peer coaches or navigators, reverse mentoring for instructors, participation in advocacy, public speaking opportunities, research)
  - The extent to which instructors' use of the high-flex model negatively affects their retention because of the demands associated with using the model, along with the incentives that might be offered to instructors to retain them
  - The extent to which a theory of change underlies the design and content of instruction and informs the choice and use of digital technology tools
- How technology can improve or accelerate adult learners' outcomes from their participation in foundational skills programs
  - The extent to which technology can differentiate and personalize instruction to improve retention and accelerate learner outcomes, considering the types of learners accessing instruction, the content and methods of the instruction, and the characteristics of the instructors
  - The design elements of the technology that are most effective with different learner populations, such as ELs, learners with low literacy, learners in correctional settings, and others
- The role of technology in adult educators' PD and professionalization
  - The extent to which instructors' participation in PD involving technology tools increases their ability to use these tools in teaching
  - The amount of training, funding, and time for training needed to elevate the professionalization of the adult foundational skills field concerning technology integration
  - The ways that data analytics can improve adult foundational skills programs and strategies for obtaining expertise in data analytics to guide its use

- Considerations in framing and conducting research on the role of technology in foundational skills programs
  - The extent to which research questions and the interests of research stakeholders guide the research design and methods so that the most reliable approaches relevant to the research aims are used
  - The range of data collected in research studies, including demographic data on who is served and not served to determine success in using an equity and inclusion framework, along with the collection of employment attainment and earnings in studies where these are predicted outcomes for learners
  - The extent to which qualitative methods, such as participatory action research, are used when an in-depth understanding of the phenomena being studied is needed
  - The extent to which key stakeholders are included in research, such as adult education practitioners and developers of learning content, in a way that enables them to provide their perspectives while using their time wisely
  - The extent to which research questions explore relationships among the critical variables involved in using technologies, such as program infrastructure, program administration, and policies, and draws from work in adjacent settings or populations

These questions provide a starting point for discussions among adult foundational skills stakeholders about priorities and directions for building a knowledge base that will help guide practice in using digital technologies.

## Conclusion

The adult foundational skills field is at a critical point in moving forward for two reasons: the COVID-19 pandemic prompted the increased use of digital technologies, and the interest and need of adults to be better prepared to support themselves and their families. All aspects of services that adult foundational skills programs deliver, particularly those involving technology, could benefit from a deeper knowledge base and more reliable evidence. The key stakeholders in the field support the need for more informed delivery of services, and researchers are excited about the opportunity to develop knowledge that can benefit all stakeholders, particularly adult learners.

The convening provided an opportunity for stakeholders to express their thoughts and concerns and come together to discuss next steps in strengthening the knowledge and evidence base in using digital technologies. The information from this session provides key ideas for moving forward that can help stimulate next steps.

## References

- Askov, E. N., Bixler, B., & Maclay, C. M. (1986). *Evaluation of computer courseware for adult beginning reading instruction in a correctional setting* (Final report). Pennsylvania State University, Institute for Study of Adult Literacy. <https://files.eric.ed.gov/fulltext/ED317758.pdf>
- Rachal, J. R. (1993). Computer-assisted instruction in adult basic and secondary education: A review of the experimental literature, 1984–1992. *Adult Education Quarterly*, 43(3), 165–172. <https://doi.org/10.1177/0741713693043003003>
- McCain, M. L. (2009). *The power of technology to transfer adult learning: Expanding access to adult education & workforce skills through distance learning*. Council for Advancement of Adult Literacy. <https://files.eric.ed.gov/fulltext/ED508552.pdf>