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Technology Use and Integration in Adult Education and Literacy Classrooms

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Recommended Citation

Rose, Glenda Lynn; Wang, Chih-Wei; Sainz, Amanda; and Joshi, Suresh (2019). "Technology Use and Integration in Adult Education and Literacy Classrooms," *Adult Education Research Conference*. <https://newprairiepress.org/aerc/2019/papers/2>

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Technology Use and Integration in Adult Education and Literacy Classrooms

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Abstract: Instructors and programs in adult education and literacy classrooms face challenges with technology integration due to minimal internet and mobile phone service availability, and limited financial support for professional development.

Keywords: Technology integration, Adult education and literacy, AEL instructor

Introduction

Technology tools help people solve problems only if they can effectively use those tools. Like the rest of the population, technology is an integral part of the lives of adult education and literacy (AEL) students. In 2015, 55%-75% of the 4.1 million AEL students enrolled in programs owned a smartphone, allowing them to use technology to read, write, learn and connect with people (Rosen & Vanek, 2017). Once adult learners are able to use technology more proficiently, more informal and formal learning opportunities become available to them. Research shows that a combination of online and face-to-face instruction is more effective for learning (Inverso, Kobrin, & Hashmi, 2017), and data in the Texas Educating Adults Management System (TEAMS) has reflected that research for the past five years. Students who have a combination of distance learning (DL) hours and face-to-face (F2F) hours tend to outperform both students with only F2F hours and students with more than 50 percent of their hours as DL (See *Figure 1*).

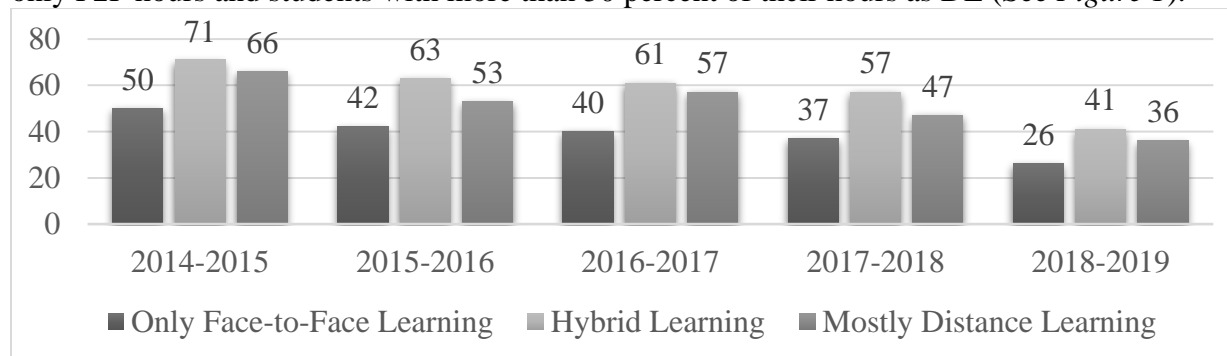


Figure 1. Percentage of Student Completion from TEAMS data

According to the Workforce Innovation & Opportunity Act (WIOA), AEL services must include digital literacy: “the skills associated with using technology to enable users to find, evaluate, organize, create, and communicate information” (US. Department of Education, 2015, p. 1). Inverso, Kobrin, and Hashmi (2017) pointed out that teaching digital skills can stimulate higher-order learning, allowing students to combine their learning with technology. For adult learners, this includes practical applications of technology, such as having the ability to navigate online maps. Thus, AEL educators should integrate technology into their courses to support students’ self-directed learning skills.

The digital divide also drives the need to teach digital literacy in AEL. Digital divide research reveals that the lack of digital proficiency in K-12 is due to insufficient resources and parental support. Adults need digital literacy to move out of unskilled labor positions and support

their children in school, among other things. (Conceição & Martin, 2016; Katz, Gonzalez, & Clark, 2017). For example, a study of Latino students and parents (Machado-Casas, Sanchez, & Ek, 2014) indicated that parents who valued technology usage communicate better with their children's schools. If the parents are not digitally literate, a gap in communication may result, which may influence student performance. The Latino families evaluated in this study had lower incomes and limited internet access. They attended a series of technology workshops to improve their digital literacy, which helped them to better support their children's academic career. The authors concluded that technology has become a tool for student success and a sharing tool between children and parents in the digital world.

However, little research exists on the use of technology in the AEL classroom. Since technology has become a tool to augment teaching effectiveness, instructors should be using technology in their classrooms. As Texas has a large population of AEL participants served under WIOA, evaluating the current level of technology use and classroom integration among AEL instructional staff is critical to improving student outcomes. Thus, this study is to examine the technology proficiency of AEL instructors in Texas.

Theoretical Framework

We adopted the Will Skill Tool (WST) model of technology integration (Knezek, Christensen, Hancock, & Shoho, 2000) as the theoretical framework to guide this study. Knezek and his colleagues (2000) developed the WST model to explain how an educator's will (computer attitude), skill (technology competence), and tools (access to technology) contribute to classroom technology integration and student achievement. This model has been applied in various K-12 contexts (e.g., Texas: Knezek, Christensen, & Fluke, 2003, Ghana: Agyei & Voogt, 2011, and Switzerland: Petko, 2012). We used this framework to investigate AEL instructors' willingness to use technology in their classrooms, to examine their skill level in using technology, and explore digital tool availability in AEL classrooms.

This study sought to answer the following three questions:

1. Where is Texas in terms of AEL teachers' personal and professional use of technology?
2. What factors contribute to the differences across programs with regard to teachers' integrating technology into classes?
3. How do administrators perceive the use of technology by their teachers?

Methods

This mixed methods design is based on a sequential explanatory design in two phases (Creswell, 2008). In the first phase, we collected survey data and analyzed it. The survey data collection helped us determine AEL instructors' current proficiency in technology use in both personal and instructional contexts. In the second phase, we conducted interviews with program administrators and analyzed them using thematic coding because we felt it was important to gain insight from both instructors and administrators to generate reasonable conclusions. Finally, we discussed and interpreted the entire analysis.

The cross-sectional survey was distributed both online and paper-based to 2,500 instructors with WIOA-funded programs and 1,000 volunteer teachers in Texas with a 10.45% response rate (N=366). The data collection period was from November 2017 to January 2018. The survey questions are based on the Technology Proficiency Self-Assessment Questionnaire for 21st Century Learning from Christensen and Knezek (2017) with a five-point Likert scale

from 1=strongly disagree to 5=strongly agree. It has a total of 34 items with 19 items for professional use of technology in the classrooms and 15 items for the personal use of technology.

We selectively chose the phone interview participants in order to have two state-funded programs from eight regions based on Workforce Areas in Texas as defined by the Texas Association for Literacy and Adult Education (TALAE). 16 program administrators listed as state-funded program contacts were invited and 15 agreed to participate. Therefore, we conducted 15 semi-structured phone interviews with 15 different program administrators in August 2018. The phone interviews were about 30-60 minutes and audio-recorded using the WebEx web conferencing system. The audio files were transcribed for analysis.

Quantitative Results

We used SPSS 25 to conduct reliability, descriptive and variance analyses for the survey data. The reliability Cronbach's alpha of the 34-item scale is .97. The descriptive results showed that the average mean score on personal use of technology is 4.40 and on the professional use of technology in the classrooms is 4.06. The item on the confidence of creating a class web page has the lowest mean score ($M=3.35$, $SD=1.36$) and the confidence of sending an email has the highest mean score ($M=4.78$, $SD=.65$).

The one-way analysis of variance (ANOVA) results showed that there is no significant difference between groups for the paper-based survey and the online version. However, there are significant differences ($p<.05$) between programs on the personal use of technology on all items except creating a class web page [$F(20,342)=.93$, $p=.55$]. Further, half of the items on the professional use of technology in the classrooms (such as using technology to collaborate with teachers or students who are distance from the classroom [$F(20,343)=2.04$, $p=.01$] or use social media tools for classroom instruction [$F(20,342)=1.97$, $p=.01$]) are significantly different.

Two items on the professional use of technology are significantly different based on urban ($n=6$) and rural ($n=9$) program designation in ANOVA. Instructors in urban programs felt more confident in using the computer to create a slideshow presentation ($M=4.50$, $SD=.88$) than instructors in rural programs ($M=4.27$, $SD=1.12$), [$F(20,343)=4.62$, $p=.03$]. Instructors in urban programs also felt more confident in describing five software programs or apps that they would use in their teaching ($M=4.07$, $SD=1.01$) than instructors in rural programs ($M=3.81$, $SD=1.26$), [$F(20,343)=4.63$, $p=.03$].

Qualitative Findings

We used ATLAS.ti 8.0 for thematic coding of the interviews to gain insight into the administrators' perspective on the use of educational technology across programs. We identified several core themes.

Educational technology usage. All AEL programs have access to at least a computer lab at a community college or independent school district. However, the availability of technology equipment in the classrooms and access to computer labs varies based on the site location. Classes held in community locations such as houses of worship, libraries, and community centers may not have digital access.

AEL instructors incorporate different tools with their teaching methods including learning management systems, MS Office, Google Classroom, Formative, Kahoot, Poll Everywhere, Prezi and Quizlet. Rural program administrator (RPA) 8 shared: "It's Kahoot but not everybody uses Kahoot...depends on the teacher's level of technology experience and how comfortable they feel. At site A and B, the teachers there do use Kahoot and some quizzes on the Quizlet."

AEL instructors use computers to teach technical skills such as searching for information, creating career profiles, researching topics, using software programs such as Burlington English and Google Docs and so on. RPA 6 said:

The students use the computers to do resumes, job searches, do Khan Academy if they're struggling with a particular thing in math especially. We have a computer lab here and all of our students go through that lab at least once a week, spend two hours up there and usually that's for research purposes.

Limited internet access. Geographical circumstances such as unreliable cell phone and internet access in rural locations make it difficult for students and teachers to use online tools and applications in class. Many rural locations in Texas depend on satellite phone technology, making virtual communication difficult. RPA 9 specified: "In another county, we have a class in a church with very limited spotty internet. We have laptops we take over to do business but the students don't have a lot of access to it, nor do the teachers."

Nor is Internet connectivity guaranteed in urban centers. AEL classes are often housed in off-site locations such as public libraries, public schools, houses of worship, and community centers where Internet-enabled technology is not always available. Often, programs must supply their own hardware and internet connection (via hotspots). Urban program administrator (UPA) 1 pointed out that for "satellite sites, it's almost nonexistent. You know, it's typically community rooms and sometimes they have Wi-Fi and sometimes they don't."

Limited funding. Finding funds to support classroom technology integration is also a struggle for many programs. Program administrators expressed the need for newer computers and upgraded software or subscription services. RPA 4 shared: "The biggest challenge I have is my lack of financial resources. My computers are about 10 years old and I just absolutely have no funds to replace them."

Lack of funding also affects technology-based professional development (PD). PD can become costly for programs, and budgeting restrictions make the use of paid PD hours for technology training less likely due to insufficient funding to support instructional time, course-prep time, and additional PD hours for learning new technology. RPA 9 argued:

I know that when you try to pay someone for virtual instruction, you have to be very careful. That's been another challenge is how do you count those hours? ... I guess my question is: we had no precedent to say it would take X amount of prep time to implement this [creating a video].

Limited scheduling time. AEL instructors in Texas are mostly part-time and have a minimum PD requirement of 15-hours per program year. A large number of AEL instructors are on an institutionally mandated schedule that only allows for 19 paid working hours per week. PD above the 15-hour requirement means scheduling difficulties with the 19-hour rule. Thus, teachers have limited time to invest in PD to increase their technology skills. When they devote time to additional PD, they have less time to teach. Rural program directors noted:

It's just people are busy, and this is the other piece is that they're part-time teachers. So, they invest a little time in technology if they don't have a knack for it already because maybe they're working full time at the [school] district and so anything extra is... if they're not already inclined to be doing it, they're probably not going to do it.

Resistance. AEL programs often hire retired K-12 teachers who may have a higher resistance to learning new technology. They may not see the necessity of teaching digital literacy or are not motivated to learn new technology. Forcing teachers to improve their digital literacy is

difficult. Further, if they are not comfortable with the technology, they will not use it in class. As a result, programs struggle with promoting technology integration. RPA 3 expressed:

Our teachers are part-time. I'd say maybe 25% of them are into tech and the rest, we have a retirement type of teacher where their job is kind of their retirement job where they've already retired and this is kind of the extra job they're doing. It's a matter of we encourage the use of technology, but if they don't want to do it we don't push it.

Discussion

This study provides a snapshot of the status of technology use and integration in AEL programs in Texas. Many AEL instructors integrate technology in various ways in their classrooms; however, programs still face challenges. The digital divide remains evident in AEL, especially in rural parts of the state. With a lack of internet access, AEL teachers cannot adequately integrate technology into instruction. Many programs need more funding opportunities to support quality internet access and technology equipment. Programs might consider developing partnerships with off-site host locations to secure technology support for their classes. They could consider offering a digital device loan service for students who may not be able to purchase their own equipment. We also suggest that programs explore downloadable educational programs that allow students to access content in-and-outside of the classrooms without internet access. Innovative instructional activities, such as lessons by phone or video conference is another solution. Hybrid classes utilizing fewer face-to-face meetings, and more virtual class sessions is another idea. These options should be supported by a robust distance learning program to support students who are studying predominantly on their own.

Limited funding is a key issue that almost all programs face. To address this issue, programs should seek funding that can be braided with state funds to expand their digital literacy programs. By doing so, programs may be able to pay instructors, purchase technology equipment, and open more site locations in rural areas. One program administrator mentioned that they were able to braid funding with their nearby ISD, and they now have access to computer labs. The Texas Center for The Advancement of Literacy and Learning (TCALL) can provide PD opportunities for programs in Texas to facilitate this process in conjunction with their Texas Workforce Commission AEL program specialist.

Currently, most AEL instructors are part-time and many are current or retired K-12 teachers. They have limited time to devote to both teaching and professional development. Moreover, programs cannot increase teachers' working hours beyond institutional restrictions for part-time instructors. Many retired K-12 teachers are unfamiliar with the latest educational technology and require more intensive hands-on PD. Providing PD opportunities that honor teachers' time and ensure skill gains is one solution. Besides teacher resistance to technology use, many program administrators discussed the need for ongoing training and technology support. A one-workshop "sit-and-get" session is not effective as these teachers need someone locally to help them implement and reflect on their use of technology. TCALL has created a Tech Integration Coach Pathway, which is a gamified, seven-level PD series of courses based on the International Society for Technology in Education's standards for students, educators, and coaches (ISTE, 2019) to have more "boots on the ground" at local programs to help with technology integration. Technology coaches can better support instructors on-site and reduce their resistance. However, not all programs have staff members participating in the program.

Requiring programs to develop and compensate technology coaches could ensure that every program has technology coaches available to assist AEL instructors with technology integration.

In addition, with more funding opportunities, programs may be able to hire more full-time AEL instructors, which would alleviate some of the issues around restricted paid hours for PD and result in instructional staff who may be more vested in professional growth.

A limitation of this study is that we only interviewed programs receiving AEL funding from the Texas Workforce Commission. Non-state-funded programs might face different struggles, which need to be explored to establish a well-rounded understanding of technology integration in AEL. Another limitation is that the survey is self-report data. Observation on how technology is being used in different classrooms would reveal if teachers accurately reflect on their use of technology.

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