Illiteracy Among US Adults

Alyssa Clark and Chloe Haderlie

Summary

Illiteracy affects a person's ability to fully participate in and contribute to society. About 18% of the US adult population is functionally illiterate. Hispanics, older people, and incarcerated people are more likely to be low literate than other US adults. Major factors influencing literacy development include education, socioeconomic status, learning English as a second language, learning disabilities, and crime. Many of the causes and consequences of illiteracy are intersecting and cyclical. Additionally, illiteracy is often perpetuated from parent to child and is likely to lead to higher chances of unemployment and poverty. Adult literacy programs with a developed curriculum and personalized instruction are the most effective ways to improve literacy. In order to prevent and treat illiteracy in the United States, collaboration between researchers, nonprofits, governments, and public schools will be necessary.

Key Terms

Dysgraphia—"Impairment of handwriting ability that is characterized chiefly by very poor or often illegible writing or writing that takes an unusually long time and great effort to complete. When present in children, dysgraphia is classified as a learning disability. When it occurs as an acquired condition in adults, it is typically the result of damage to the brain (as from stroke or trauma)."[1]

Illiteracy —The inability to read or write.

Literacy—Understanding, evaluating, using, and engaging with written text to participate in society, to achieve one's goals, and to develop one's knowledge and potential.[2]

Limited English Proficient (LEP)—"Individuals who do not speak English as their primary language and who have a limited ability to read, speak, write,

or understand English can be limited English proficient, or LEP"[3]

Low Literacy (also known as Functional Illiteracy)—The ability to read relatively short texts and understand basic vocabulary but the inability to comprehend advanced texts and vocabulary. This definition corresponds with having a score of level one or lower on the PIAAC literacy evaluation.[4]

Context

The ability to read is an important skill for people to develop because it reduces the risk of poverty, increases employability, increases social inclusion, and leads to a healthy life.[5] If a person cannot read or comprehend what she is reading, her ability to contribute to and participate in society is significantly limited. Many people think of literacy as the ability to read and illiteracy as the complete inability to read. Of equal importance, however, is low literacy, also known as functional illiteracy.[6] A functionally illiterate person is able to read relatively short texts and understand simple vocabulary; however, he may struggle with basic literacy tasks such as reading and understanding menus, medical prescriptions, news articles, or children's books.[7] In 2014, reports indicated that 18% of US adults (approximately 57.4 million people) are functionally illiterate. Other sources indicate that up to 90 million US adults lack basic literacy skills.[8]

Illiteracy has many negative impacts on individuals and society. Overall, low literate adults participate less in the labor force, earn less, and are less likely to read to their children, which may stunt their children's literacy development.[9] As illiteracy may be passed from parent to child, subsequent generations are likely to suffer from unemployment and poverty. Other negative consequences of illiteracy include crime, poor health, low academic performance, and slow economic growth. It is estimated that these negative social and economic outcomes cost the United States $362.49 billion annually.[10] Countries with higher literacy rates have more national productivity, better health, and greater equality than nations with lower literacy rates.[11]

The shame associated with learning disabilities (LDs) and low literacy sometimes prevents individuals from seeking the help they need to become literate, perpetuating the issue throughout an individual's lifetime. Many low-literate individuals hide their illiteracy from their employers, associates, children, and even spouses. Studies show that 53% of low-literate adults have never told their children about their reading inability.[12] Feelings of shame and inadequacy may lead to low self-esteem and poor mental health.[13] These feelings create an emotional barrier, further inhibiting illiterate adults from seeking help in learning to read.

Literacy Development

Learning to read combines three main cognitive skills: auditory processing, decoding, and comprehension.

- Auditory Processing begins in childhood when a person starts to hear, understand, and use words.

- Decoding occurs as a person learns to sound out or recognize written words.

- Comprehension happens when the reader derives meaning from words, sentences, and entire texts, once the content has been decoded.

AUDITORY PROCESSING	Sound-Symbol Association:	DECODING	Word Meaning:	COMPREHENSION
A person begins to hear, understand, and use words	A person begins to associate letters with sounds	A person learns to sound out and recognize words	A person learns to derive meaning from words	A person begins to understand sentences and process texts from which they derive meaning

Figure 1.1

Both decoding and comprehension are developed through speaking and reading. An individual's literacy skills are heavily influenced by the language abilities and vocabulary of the people closest to the individual (for example, family members, neighbors, and friends).[14,15] Most people learn to read when they are young, and their comprehension increases as they grow up because they are exposed to more words and ideas through school and life experience. Simply put, low literacy is caused by a failure to adequately develop these three main reading and comprehension skills.

Demographics

Illiteracy tends to affect Hispanics, older people, and the incarcerated more than other US adults. Hispanics have the highest percentage of low literacy scores, followed by Blacks, Others, and Whites. [16] Racial segregation and the number of non-native English speakers among minorities may correlate with low literacy in those groups. Older adults in all racial groups are also more likely to be low literate: about 28% of 66–74 year olds have the highest percentage of low literacy.[17] This pattern may be due to increased access to education over time. As educational opportunities have expanded in the United States, younger generations have benefitted from the changes while older age groups have not. Another reason may be because some older adults do not continue to practice their literacy skills after completing their formal education. Finally, low-literate adults are overrepresented in US prisons (different reports indicate that 29%–60% of incarcerated adults are low literate).[18,19]

Results of a nationally representative survey from 2003,[20] in combination with US Census data from 2000,[21] show correlations between illiteracy, low income, low levels of education, and unemployment. All of these issues are concentrated in Southern states and urban locations. Possible explanations for the intersectionality of race, poverty, age, and incarceration will be outlined in the following sections.

Contributing Factors and Consequences

Note: Many of the contributing factors to illiteracy are both causes and consequences and will be addressed together.

Education

A quality education provides foundational literacy skills that contribute to adult literacy. When education is limited, literacy is limited. Among developed countries, the United States ranks 24 out of 35 countries in reading scores.[22] Additionally, literacy rates have not improved over time, revealing that US schools continue to underperform. Socioeconomic and racial inequality in neighborhoods are correlated. Both inequalities lead to educational inequality. The intersection of these three inequalities is most heavily concentrated in urban areas.

Socioeconomic and racial inequality are interconnected. Both minority students and low-income students tend to underperform on tests and have low literacy levels. When a student living in poverty is also from a racial minority group, then he is even more likely to be low literate.[23] In many of the largest cities in the United States, a majority of students are from minority groups and three-quarters of students are poor.[24] In cities, where poverty and racial inequality intersect, students in 8th grade perform 8%-10% worse than students in rural, town, and suburban public schools on reading achievement tests.[12] Though many people mistakenly think that racial segregation has ended, research shows that US schools are currently re-segregating by race and income. These trends particularly affect Hispanic and black students.[25]

Socioeconomic Inequality in Education

Quality of education depends on equality in schools.[26] Because public schools are largely funded by local property taxes, living in a low-income area generally means going to a low-income school.[27] This structure leads to a lack of funding, a lack of resources, and fewer teachers in poor schools. These outcomes, in turn, affect a child's future educational attainment and income.[28] Schools in low-income areas have less support from parents.[29] Additionally, students from low-income backgrounds are less likely to have adult mentors with college experience.[30] The resulting inequality in schools leads to lower average literacy and academic performance in poor schools.

When schools do not have adequate funding, they are forced to take at least some of the following measures:

- Employ fewer teachers and increase class size

- Hire underqualified teachers

- Cut funding for important instructional resources such as books and computers

Employing enough skilled teachers is essential because quality of instruction plays an important role in literacy development. The larger the class size, the less one-on-one instruction students receive. The disparity increases the chances that students will graduate with poor reading skills and be low literate as adults. Teacher shortages tend to most significantly affect low-income schools with high concentrations of minority populations, perpetuating racial and economic inequalities.[31]

Racial Inequality in Education

Racial inequality in education affects student success and literacy development. Academic achievement is measured by student performance on standardized tests. Results from these tests show that black and Hispanic students perform worse than white students.[32] Research indicates that this inequality in schools continues to affect achievement levels; black students are twice as likely to underperform as white students.[33] Experts suggest that minority-group students may underperform because their teachers and peers tend to have lower expectations for them.[34] Research projects that eliminating racial segregation in schools would close over 10% of the achievement gap for black and white students.[35]

Racial discrimination in schools contributes to minorities having lower literacy levels. During the first half of the 1900s, racial segregation in schools was legal. However, in 1954, *Brown v. Board of Education* abolished racial segregation in public schools because segregation violated equal rights. Although this change legally granted black people and white people equal access to education, segregation still persisted in practice.[36] When schools and neighborhoods became legally integrated, many white people moved away from their newly integrated neighborhoods. This "white flight" left behind schools that continue to be poor and segregated to this day.[37] As a result, some neighborhoods now have high concentrations of minority groups and low-income families.

As mentioned previously, older adults are more likely to be low literate. Historical discrimination is one possible explanation for this tendency. Changes in access to education, during the second half of the 1900s, partially spurred by the response to racial discrimination, may help explain why older adults, especially older adults from racial minority groups, tend to have lower literacy levels. Many older adults experienced these changes in access to education and societal attitudes

during their lifetimes and were thus directly influenced by them.

Poverty

Poverty and low literacy have a cyclical relationship. Low-literate adults are more likely to live in poverty than high-literate adults; about 43% of low-literate adults live in poverty, compared to only 5% of people at the highest literacy level.[38] Studies show that literacy levels vary more with socioeconomic status than with ethnicity or gender.[39]

Poverty limits literacy development at all stages (see Figure xx). Research indicates that a mother's education is the most important indicator of her child's future educational achievement.[40] If a child's parent is illiterate, the parent will not be able to teach her child to read, increasing the likelihood that a child will be illiterate as well. Because language first develops orally, what a child hears at home will impact his or her future literacy abilities. Approximately 86%–98% of a child's vocabulary comes from his parent's vocabulary. The number and variety of words heard at home differ between wealthy and poor households. By age three, children in high-income homes have heard 30 million more words than children in low-income homes, significantly influencing the children's future literacy development.[41]
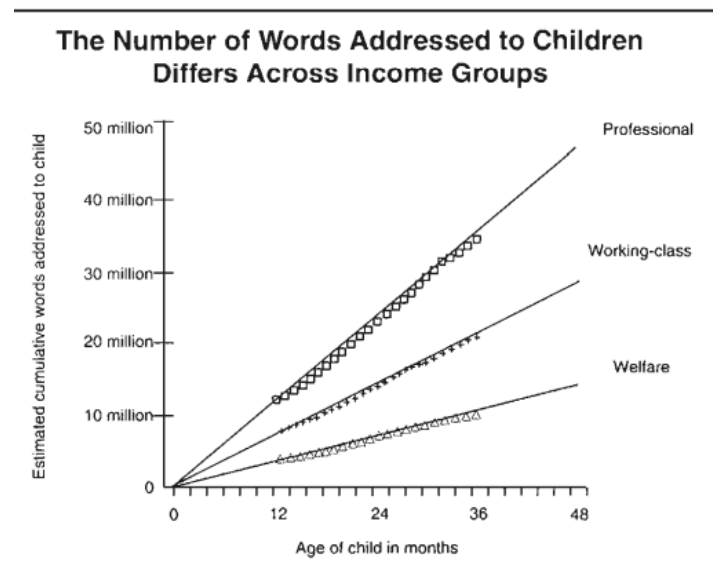

The Number of Words Addressed to Children Differs Across Income Groups

Figure 1.2

Additionally, low-income students are more likely than their wealthier peers to do the following:

- Develop reading and language acquisition skills later[42]

- Not attend preschool[43]

- Attend poorly funded schools[44]

- Read less and have fewer books in the home[45]

- Struggle to regulate emotions in social situations[46]

- Develop learning challenges in attention, memory, and thinking[47]

- Stop attending school to contribute to their family's income[48]

Low literacy limits employment opportunities, leading to increased poverty rates and future poverty for the individuals affected. Many low-skill jobs are outsourced or may be replaced by technology, leaving many illiterate adults unemployed.[49] Approximately 24% of unemployed people in the United States are low literate, with higher percentages of low literacy among those who have

less than a high school education.[50] These people have a difficult time finding work because they are unqualified for many jobs that require reading skills.[51]

Non-Native English Speakers

Many non-native English speakers, such as immigrants and refugees, have low English literacy levels. While some of these people may be literate in their native tongue, they are considered illiterate in the English language. Approximately 8% (25.1 million people) of the US population ages 5 and older are Limited English Proficient (LEP).[52] Sixty-four percent of adult immigrants perform at low literacy levels, compared to 14% of native-born Americans.[53] The majority of LEP adults speak Spanish as their first language. Other large portions of the LEP population speak Chinese, Vietnamese, Korean, and Tagalog.[54]

The LEP population in the United States tends to live in poverty and to be less educated than the general population.[55] Many LEP adults have low-skill, low-wage jobs in the construction, agriculture, and service sectors that usually do not require English language skills. In 2013, 25% of LEP individuals lived below the official federal poverty line (about $24,000 for a family of four in 2013[56]).[57] Seventy-five percent of the LEP population is between ages 18 and 64.[58] Though many adult immigrants and refugees seek out English education in order to become literate, developing reading proficiency takes time. Finding time to learn is especially challenging for adults, who do not have the same structured learning opportunities as children have through the public education system.

Even if children of LEPs are taught English in the public school system, the children still may be vulnerable to challenges in literacy development. These challenges include living in poor neighborhoods, attending low-income or racially segregated schools with limited resources, and growing up in a home with parents who cannot teach them to read in English.[59] Although attending school does not guarantee English literacy, children have more resources available to them than do adults.

Learning Disabilities

Learning disabilities (LDs) are correlated with poor reading skills and are a contributing factor to low literacy in the United States. Research indicates that learning disabilities may be caused by genetics, prenatal exposure to toxins (such as lead, drugs, or alcohol), and adverse childhood experiences.[60] The learning disabilities that affect reading abilities most are dysgraphia, auditory processing deficit, dyslexia, and ADHD (attention deficit hyperactivity disorder).[61] Learning disabilities may affect literacy at all its stages, but typically have a greater impact on comprehension. People with learning disabilities can often read aloud without difficulty but may not comprehend or remember what they read.[62]

About 4.6 million Americans report having a learning disability,[63] however actual numbers are likely higher because of underdiagnosis and underreporting due to the stigmas associated with learning disabilities.[64] Reported learning disabilities are higher among those living in poverty than those living above poverty. They are also higher among school-aged children than adults;[65] however, it is estimated that 60% of adults who struggle with literacy have undiagnosed or untreated learning disabilities.[66] Diagnosis also tends to be higher among low-income, minority, and ELL children, partly due to stereotypes and bias.[67] While approximately 1 in 5 children has a learning disability, only 1 in 16 receives an individualized education plan (IEP) to help the child learn with his or her disability in public schools. This imbalance may be because 70% of teachers feel that they do not have the resources to help students with learning disabilities.[68] One common misconception about people with learning disabilities is that they are less intelligent or capable; nearly one in five parents believe that children with LDs are less intelligent.[69] In reality, rather than being less intelligent, LD children have a skill deficit in reading. Awareness of this misconception is important in helping these people to learn more effectively and with confidence.[70]

Crime

Low literacy does not cause criminal behavior, but many of the contributing factors to low literacy also contribute to criminal behavior, which may lead to incarceration. Contributing factors to both low literacy and criminal behavior include racial inequality, poverty, and education.[71] These factors make individuals more vulnerable to both crime and illiteracy.

Estimates of the percentage of incarcerated adults who are low literate range between 29%[72] and 60%.[73] A 2007 federal and state prison literacy report shows that 69% of inmates are from a racial minority and 26% of inmates did not graduate high school or obtain a GED certification. Black and Hispanic inmates had lower literacy levels than their white peers.[74]

Upon release from prison, former convicts are more likely than non-convicts to work at a low-wage job, remain uneducated, or be unemployed because of their criminal record or racial discrimination.[75] These factors increase the chances that they will commit another crime or live in poverty.[76] Some estimate that two-thirds of children who are not reading at their grade level by the fourth grade will end up in jail or on welfare.[77] Additionally, children who grow up with a parent in prison are more likely to face developmental challenges and adverse childhood experiences than children who grow up with neither parent incarcerated.[78,79] Without parental support and guidance, the children of the incarcerated are also less likely to learn to read in the home. Again, these challenges affect blacks, Hispanics, and low-income families disproportionately; for example, a black child is nearly twice as likely as a white child to have a parent in prison (14% of black children have a parent in prison).[80]

Intersecting Factors

The factors that contribute to low literacy intersect in many ways. If a person faces one of the challenges to literacy development described above, he or she is likely to face more than one because these challenges are connected. Some examples include the following:

- Poverty often overlaps with discrimination toward racial minorities and opportunities afforded non-native English speakers. It also contributes to these populations attending low-income schools.

- Incarceration increases a person's chance of poverty because of limited employment opportunities post-incarceration. Incarceration rates are also higher among minority groups, especially black men with low levels of education.

- Resegregation by race and income leads to high concentrations of poverty and crime in certain neighborhoods. These high poverty and crime rates negatively affect the education system and increase the likelihood of adverse childhood experiences. Adverse childhood experiences limit cognitive development and increase future crime, continuing the cycle.[81,82,83]

- Children from racial minority or low-income families are overrepresented in special education at schools with limited resources to help them. Being placed in special needs programs increases the chances of those children being unemployed or incarcerated in their lifetime.[84]

These examples show the complexity of societal failures that create significant barriers for some groups of people to develop adequate literacy skills. These contributing factors tend to be intergenerational, creating vicious cycles that many cannot escape.

Practices

Adult illiteracy cannot be eliminated unless gaps in childhood literacy are filled. If a person is effectively taught to decode and comprehend as a child, she will be more literate as an adult. Preventing illiteracy requires coordination and efforts from families, nonprofits, schools, and federal and state governments. Massachusetts appears to be a leader in successful public education in the United States with a high school dropout rate of only 2% and the nation's highest math and reading scores.[85] As a state, only 10% of the adult population is considered low literate (compared to the national average of 18%).[86] Potential explanations of the success include increased funding to low-income schools and districts, with a focus on hiring more teachers and providing more educational resources in the classroom. Additionally, Massachusetts has increased awareness and understanding about social-emotional education and the trauma associated with poverty and unstable family situations.[87]

An in-depth discussion of preventative practices is beyond the scope of this briefing. Nevertheless, we recognize that a combination of preventative and treatment practices will create a more comprehensive solution to this issue. The following sections focus on treatment-oriented solutions that aid adults who are already illiterate.

Donating Books

Donating books is a widespread yet ineffective practice implemented by many organizations. The objective of donating books is to provide populations that have limited access to reading materials with the resources they need to practice reading. These donations are primarily given to low-income elementary schools and low-income children so that they can have books to read over the summer months.[88] Most organizations appear to focus on donating books to children.

Impact

Millions of books are donated to schools and individuals each year. However, there is no convincing data to suggest that these donations actually increase adult literacy.

Gaps

Donations are almost always provided to children rather than adults, and therefore do not contribute to increasing adult literacy. If books are donated to families, the topics of the books are generally relevant to children and may be uninteresting to adults, causing them to go unread.[89] Ultimately, simply providing books to low-literate people will not improve literacy competence unless combined with other practices, such as effective instruction.

Collaboration with Existing Organizations and Companies

Partnerships between existing social service organizations and companies expand the reach of literacy education. For example, a nonprofit may partner with a business or another social service organization in order to reach a specific demographic, institute new programs, and share literacy instruction strategies.

ProLiteracy is the primary international organization involved in partnering. Its main goal is to add adult literacy services to existing organizations, such as libraries. ProLiteracy trains and certifies literacy instructors who teach a standard curriculum.[90] In 2016, ProLiteracy began partnering with nonprofit organizations in Salt Lake City, Utah, to provide services specifically for English language learners. This partnership interdisciplinary approach in which instructors simultaneously teach literacy basic workforce skills. The curriculum is more customized to the

needs of the population it serves and prepares immigrants and refugees for better employment while increasing their ability to read.[91]

Creating partnerships with companies to provide education to employees also expands the reach of literacy programs. In 2013, Alfalit, a nonprofit based in Florida that provides literacy training in the US and internationally, partnered with a Florida-based company, Costa Farms. Costa Farms' employees were primarily immigrants who had never had the opportunity to learn to read or write in their country or language of origin. Alfalit provides literacy training in the employees' native language.[92] Through this type of partnership, organizations gain access to more of the illiterate portion of the population, and employers also benefit by gaining employees that are more highly trained and better educated.

The National Literacy Directory is also a key player in forming collaborative efforts and enabling partnerships. This directory functions as a comprehensive database and connection point for students, volunteers, and organizations. It contains descriptions and contact information for local literacy organizations in the United States so that volunteers and students can find a program that matches their needs.[93]

Impact

Social service organizations see collaboration as a means to access greater funds and improve solutions.[94] Additionally, collaboration between existing organizations and companies can open unique doors to access specific portions of the illiterate population.

Data from individual organizations does not emphasize the impact of collaboration between organizations. However, output and outcome data is available for individual organizations that collaborate. From 2015 to 2016, ProLiteracy reached 222,397 students and certified 85,490 instructors. However, of the 244,106 students who were reached in 2014–2015, only 70,000 advanced at least one level in the curriculum (28% advancement rate).[95] Of those who do improve their literacy, 16,300 students reported finding better employment.[96] Alfalit reports that after students graduate from the program, the students can read and write at a third-grade level in their native language.[97] Over 200 people have now graduated from the Alfalit program.[98]

The National Literacy Directory facilitates collaboration with more than 7,000 literacy education agencies and over 50,000 volunteers and students. These organizations and individuals have used the directory to connect with agencies that meet their needs.[99] The available data does not show how many students improve their literacy as a result of these connections.

Partnerships and collaboration are not always effective. In some cases, collaborative efforts are economically inefficient or may limit the organizations' individual objectives, yielding suboptimal results.[100] Because of the lack of impact data from key partner organizations, there is no reliable assessment of collaborative effectiveness in literacy training. However, it is important to be aware of the potential costs of collaboration.

Additionally, the National Literacy Directory is not a direct solution to adult illiteracy because it does not offer specific services to the illiterate population. Rather, it plays an important intermediary role by facilitating access to improved services and information for students, volunteers, and organizations. One potential gap is the accessibility of information to low-literate adults who may struggle to navigate the written information on the database.

Prison Literacy Programs

Providing education to adults in prison can increase adult literacy. Many prisons offer some form of education program for their inmates through prison-led initiatives or collaboration with nonprofits, community volunteers, churches, or colleges. These programs provide education at various levels, including the following:

- Adult basic education: instruction in basic arithmetic, reading, writing, and English as a second language

- Adult secondary education: high-school or high-school-equivalency-level education that prepares students to earn their GED certificate

- Vocational education or career technical education (CTE): skill training for employment in specific jobs or industries

- Postsecondary education: instruction at the college level, which helps a student work towards a two- or four-year degree[101]

These programs exist throughout the nation; more than 28 states have college education programs in prison, and more than 100 prisons have academic and career programs.[102]

Impact

Extensive research has been conducted to evaluate the effectiveness of prison education programs in general, but there is less data about prison literacy programs specifically. Reliable research indicates that providing education to prisoners not only increases their academic achievement, but also reduces their chance of reoffending by 43% and increases their chance of obtaining better employment when they are released by 13%.[103] This research also indicates that investing tax dollars in education programs

has a 400% return when compared to the costs of re-incarceration.[104]

Gaps

There is a lack of evaluation of individual literacy programs. Because of this lack of data, it is unclear which literacy programs are most effective. Experts suggest that funds be allocated to researching and evaluating programs that use new and potentially more impactful instructional models.[105]

One of the major gaps in prison education programs is obtaining sufficient funding. Some funding comes through taxes; other funding comes through philanthropic donors such as nonprofits, churches, and individuals.[106] Lack of funding also results in a lack of access to literacy programs. While more than 28 states have implemented these programs in prisons, many others have not. Lack of funding contributes to this disparity.

Online Resources and Technological Tools

A method that has emerged alongside the development of technology is the use of online education tools. This is done through a variety of online resources, such as websites and phone apps. Some organizations are using technology to specifically help people with learning disabilities who may struggle to learn in traditional ways.[107] Other organizations are working to increase access to educational tools through technology such as tablets and e-books.[108]

The use of technology to help students and adults with learning disabilities has been particularly innovative. By providing text-to-speech, speech-to-text, and organizational tools, students with learning disabilities have been able to improve their decoding, comprehension, and writing skills.[109],[110] Similar tools aimed at vocabulary development are used for ELL students.[111] These practices are being implemented in classrooms as well as adult literacy programs.

Given the current trend, technology-heavy methods of instruction will likely continue to be employed for literacy instruction. These methods, if paired with empirically proven methods of literacy instruction and an initiative to foster a culture of reading in US homes, may improve literacy.

Impact

There is no empirical evidence to suggest that online tools and phone apps improve literacy. Some speech professionals are skeptical about how effective these tools are.[112]

While there is not data-backed evidence to support this practice, there are some benefits to it. Using technology makes educational resources widely accessible. It is also cost-effective because most educational apps

can be obtained for free. Moreover, studies show that adult literacy instruction by means of technology did increase the subjects' ability to navigate websites, analyze media, and to evaluate online texts.[113]

Gaps

A major gap in this practice is the lack of impact data available. Because the use of these tools is both new and likely to expand, it is important that research be conducted to evaluate the effectiveness of online and electronic programs and tools.

Another disadvantage of online tools is that low-income populations, who are most vulnerable to illiteracy, may have less access to technology and the Internet. Although access to the Internet is increasing, 48% of households that make less than $25,000 per year still lack an online connection.[114]

Additionally, some critics believe that literacy is an instilled value and that instruction via technology diminishes the reading culture in American homes.[115]

English as a Second Language (ESL) Programs

To address the needs of a growing non-native English speaking population in the United States, many groups are developing ESL programs to improve English speaking and literacy. These programs are available through the federal government, local community centers, libraries, nonprofits, and online resources. The classes emphasize speaking, reading, and writing English—important parts of developing decoding and comprehension skills for literacy.[116] Program members practice these skills through speaking in conversation groups, reading books, and participating in other activities.[117]

Impact

ESL programs vary in their reported success rates for teaching students English and improving adult literacy. Because there is no centralized standard curriculum for ESL programs, there is no comprehensive data to assess the impact of ESL classes on literacy development. In general, however, learning to speak and read English has many benefits. Socially and culturally, English-speaking and reading abilities increase people's ability to understand the world around them. Additionally, research found that Hispanic immigrants who become fluent and literate in English have higher income and employment levels.[118]

Gaps

An assessment of ESL programs, conducted using focus groups in Santa Clara County, California, found several gaps in ESL

programs. The assessment found several shortcomings in program accessibility and effectiveness. These gaps include the following:

- Lack of coordination between ESL providers

- Limited access to information about programs for students

- Few beginner-level classes

- Inapplicable curriculum for students, especially for those who are professionals

- Issues with scheduling classes that ELLs can attend (typically better in the evenings or on weekends)

- Lack of public transportation to classes

- No organized childcare where classes are offered

- Not enough cultural awareness and sensitivity in classrooms[119]

- Student absenteeism

- Inconsistent, repetitive, and unstructured programs[120]

Adult Literacy Classes

The most effective solution to improving adult literacy is adult literacy classes. Adult literacy classes can be found at libraries, community centers, schools, and independent literacy centers throughout the United States. These classes aim to improve decoding skills, vocabulary, fluency, and comprehension.[121] Because the classes operate at the local or state level, there are not specific program standards nationwide. However, defining characteristics of adult literacy classes include the following:

- The use of texts that are at the appropriate reading level and content level for adults

- Practical and real-world application activities to ensure adults will practice their skills outside of class

- Individualized and adaptable instruction to meet unique needs of students[122]

Evidence-based and systematic instruction, when implemented effectively, can increase literacy.[123] Curriculum and instruction are always most impactful when they are personalized to a student's individual needs and learning level. Additionally, programs that incorporate systematic and engaging learning have been proven to create the best results.[124] Putting learning into context can only be done through personalized instruction. Additionally, for English Language Learners curriculum should support learning in English and their native language.[125]

Impact

Randomized control trials conducted across the nation have found that implementing any instructional programs in adult literacy classes effectively improve adult literacy. The studies also emphasize that the effectiveness of curriculum and instruction is dependent on student attendance.[126,127]

Gaps

- Lack of consistent and reliable data to show which programs are the most effective.[128]

- Challenges of creating and administering reliable tests to determine student progress.[129]

- Costs of publication and distribution of materials.

- Producing materials at an appropriate reading level for adult students.

- Accessibility to classes for the most vulnerable populations.

- Lack of programs focused on helping adults with learning disabilities, especially minority and low-income populations.

- Instructors not being properly trained or committed to the curriculum, causing it to be ineffective.[130]

- Student absence or non-participation in classes.[131]

Key Takeaways

- Functional illiteracy is defined as the inability to read and comprehend relatively short texts or understand basic vocabulary.

- Illiteracy affects 18% of US adults (approximately 57.4 million people), most commonly impacting black people, Hispanic people, and low-income individuals.

- Illiteracy is perpetuated from one generation to the next and leads to higher chances of unemployment and poverty.

- Adult literacy programs with a developed curriculum and personalized instruction are the most effective ways to improve literacy.

- Collaboration between researchers, nonprofits, governments, and public schools is necessary to prevent and treat illiteracy in the United States.

Additional Resources

https://www.nap.edu/read/13468/chapter/4#7

https://www.vera.org/research/why-invest-in-college-in-prisons

Endnotes

1 https://www.merriam-webster.com/dictionary/dysgraphia

2 Bobby D. Rampey, Robert Finnegan, Madeline Goodman, Leyla Mohadjer, Tom Krenzke, Jacquie Hogan, Stephen Provasnik, and Holly Xie, *Skills of U.S. Unemployed, Young, and Older Adults in Sharper Focus: Results From the Program for the International Assessment of Adult Competencies (PIAAC) 2012/2014 First Look*, National Center for Education Statistics (March 2016): B-1, https://nces.ed.gov/pubs2016/2016039rev.pdf.

3 Limited English Proficiency (LEP), *Frequently Asked Questions*, accessed March 28, 2018, https://www.lep.gov/faqs/faqs.html#OneQ1.

4 Rampey et. al, *Skills of U.S. Unemployed*, B-3.

5 United Nations Educational, Scientific, and Cultural Organization, *Education for People and Planet: Creating Sustainable Futures for All* (2016): 285, http://unesdoc.unesco.org/images/0024/002457/245752e.pdf.

6 World Literacy Foundation, *The Economic & Social Cost of Illiteracy: A Snapshot of Illiteracy in a Global Context* (2015): 4, https://worldliteracyfoundation.org/wp-content/uploads/2015/02/WLF-FINAL-ECONOMIC-REPORT.pdf.

7 Ibid.

8 National Research Council of the National Academies, *Improving Adult Literacy Instruction: Developing Reading and Writing* (Washington, DC: National Academics Press, 2012), 3, doi: 10.12336/13468. *The report does not specify the legal status of US adults surveyed.

9 Ibid.

10 World Literacy Foundation, *Economic & Social Cost of Illiteracy*, 5–10.

11 Ibid.

12 "Mom shares her secret after 40 years: Effects of Illiteracy," YouTube video, 13:53, posted by "ProLiteracy," June 24, 2016, https://www.youtube.com/watch?v=ZtDtP8K_BlA.

13 "Consequences of Illiteracy | Literacy Foundation," Fondation pour l'alphabétisation, accessed March 29, 2017, https://www.fondationalphabetisation.org/en/causes-of-illiteracy/consequences-of-illiteracy/.

14 Barbara Culatta (Professor of Communication Disorders at Brigham Young University), interview by Alyssa Clark, June 16, 2017.

15 Timothy Shanahan and Christopher J. Lonigan, "The Role of Early Oral Language in Literacy Development," *Language Magazine*, accessed June 2017, https://www.languagemagazine.com/5100-2/.

16 https://nces.ed.gov/surveys/piaac/results/makeselections.aspx.

17 https://nces.ed.gov/surveys/piaac/results/makeselections.aspx.

18 National Center for Education Statistics, *Highlights from the U.S. PIAAC Survey of Incarcerated Adults: Their Skills, Work Experience, Education, and Training* (2014): 6, https://nces.ed.gov/pubs2016/2016040.pdf.

19 "Literacy Statistics," Begin to Read, accessed August 9, 2017, http://www.begintoread.com/research/literacystatistics.html.

20 https://nces.ed.gov/naal/estimates/StateEstimates.aspx.

21 https://www.census.gov/censusexplorer/censusexplorer.html.

22 Drew DeSilver, "U.S. Students' Academic Achievement Still Lags That of Their Peers in Many Other Countries," Pew Research Center, February 15, 2017, http://www.pewresearch.org/fact-tank/2017/02/15/u-s-students-internationally-math-science/. The terminology "developed countries" was determined by the Pew Research Center.

23 Janie Boschma and Ronald Brownstein, "The Concentration of Poverty in American Schools," *The Atlantic*, February 29, 2016,

https://www.theatlantic.com/education/archive/2016/02/concentration-poverty-american-schools/471414/.

24 Janie Boschma and Ronald Brownstein, "The Concentration of Poverty in American Schools," *The Atlantic*, February 29, 2016,

https://www.theatlantic.com/education/archive/2016/02/concentration-poverty-american-schools/471414/.

25 Gary Orfield, *Schools More Separate: Consequences of a Decade of Resegregation*, Harvard Civil Rights Project (July 2001), https://eric.ed.gov/?id=ED459217.

26 Julia Ryan, "American Schools vs. the World: Expensive, Unequal, Bad at Math," *The Atlantic*, December 3, 2013, https://www.theatlantic.com/education/archive/2013/12/american-schools-vs-the-world-expensive-unequal-bad-at-math/281983/.

27 Bruce J. Biddle and David C. Berliner, "A Research Synthesis / Unequal School Funding in the United States," *Educational Leadership* 59, no. 8 (May 2002): 48-59, http://www.ascd.org/publications/educational-leadership/may02/vol59/num08/Unequal-School-Funding-in-the-United-States.aspx.

28 Mike Honda, "Why American Students Lag Behind," CNN, December 17, 2010, http://www.cnn.com/2010/OPINION/12/17/honda.education/index.html.

29 Boschma and Brownstein, "The Concentration of Poverty."

30 Ibid.

31 Joe Heim, "America Has a Teacher Shortage, and a New Study Says It's Getting Worse," *The Washington Post*, September 14, 2016, https://www.washingtonpost.com/local/education/america-has-a-teacher-shortage-and-a-new-study-says-its-getting-worse/2016/09/14/d5de1cee-79e8-11e6-beac-57a4a412e93a_story.html?utm_term=.88fd6ebb8bd9.

32 Stanford Center for Education Policy Analysis, "Racial and Ethnic Achievement Gaps," accessed August 30, 2017, http://cepa.stanford.edu/educational-opportunity-monitoring-project/achievement-gaps/race/#sixth.

33 Eric A. Hanushek, John F. Kain, and Steven G. Rivkin, "New Evidence about *Brown v. Board of Education*: The Complex Effects of School Racial Composition on Achievement," *Journal of Labor Economics* 27, no. 3 (2009) 349–383, https://doi.org/10.1086/600386.

34 Eric A. Hanushek, John F. Kain, and Steven G. Rivkin, "New Evidence about *Brown v. Board of Education*: The Complex Effects of School Racial Composition on Achievement," *Journal of Labor Economics* 27, no. 3 (2009): 349-383, https://doi.org/10.1086/600386.

35 Ibid.

36 Alex McBride, "Brown v. Board of Education (1954)," *KUED*, last modified December 2006, http://www.pbs.org/wnet/supremecourt/rights/landmark_brown.html.

37 Elisa Crouch and Walker Moskop, "Poverty and academic struggle go hand in hand," *St. Louis Post-Dispatch*, May 17, 2014, http://www.stltoday.com/news/local/education/poverty-and-%20academic-struggle-go-hand-in-hand/article_944bf0f6-c13f-5bbc-9112-9ab9ae205607.html.

38 "Literacy Statistsics," *Begin to Read*, accessed June 14, 2016, http://www.begintoread.com/research/

literacystatistics.html.

39   Carol H. Rasco, "America's Literacy Crisis: An Overlooked Epidemic," *Media Planet*, accessed June 8, 2017, http://www.educationandcareernews.com/learning-tools/americas-literacy-crisis-an-overlooked-epidemic.

40   Barbara Culatta, interviewed by Alyssa Clark, Professor of Communication Disorders at Brigham Young University, June 16, 2017, Brigham Young University.

41   Betty Hart and Todd R. Risley, "The Early Catastrophe: The 30 Million Word Gap by Age 3," *American Federation of Teachers* 27, no. 1 (Spring 2003): 4–9, http://www.aft.org/sites/default/files/periodicals/TheEarlyCatastrophe.pdf.

42   Jennifer Buckingham, Robyn Beaman, and Kevin Wheldall, "Why Poor Children Are More Likely to Become Poor Readers: The Early Years," *Educational Review* 66, no. 4 (May 14, 2013): 428–446, http://dx.doi.org/10.1080/00131911.2013.795129.

43   Ibid.

44   Biddle and Berliner, "A Research Synthesis."

45   Gary W. Evans, "The Environment of Childhood Poverty," *American Psychologist* 59, no. 2 (February/March 2004): 77–92, doi: 10.1037/0003-066X.59.2.77.

46   Evans, "Environment of Childhood Poverty."

47   Gary W. Evans, "The Environment of Childhood Poverty," *American Psychologist*, February/March 2004, 59, no. 2 (2004): 77-92, DOI: 10.1037/0003-066X.59.2.77.

48   Paula Fomby and Andrew J. Cherlin, "Family Instability and Child Well Being," *American Sociological Review*, April 2007, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3171291/.

49   https://projects.cberdata.org/123/how-vulnerable-are-american-communities-to-automation-trade-urbanization

50   https://nces.ed.gov/surveys/piaac/results/makeselections.aspx.

51   Robert Roy Britt, "14 Percent of U.S. Adults Can't Read," *Live Science*, January 10, 2009, http://www.livescience.com/3211-14-percent-adults-read.html.

52   Jie Zong and Jeanne Batalova, "The Limited English Proficient Population in the United States," *Migration Policy Institute*, July 8, 2015, http://www.migrationpolicy.org/article/limited-english-proficient-population-united-states.

53   Duke Helfand, "U.S. Literacy Rates Among West's Highest, Study Finds," *Los Angeles Times*, September 9, 2000, http://articles.latimes.com/2000/sep/09/news/mn-18121.

54   Jie Zong and Jeanne Batalova, "The Limited English Proficient Population in the United States," *Migration Policy Institute*, July 8, 2015, http://www.migrationpolicy.org/article/limited-english-proficient-population-united-states.

55   Jie Zong and Jeanne Batalova, "The Limited English Proficient Population in the United States," *Migration Policy Institute*, July 8, 2015, http://www.migrationpolicy.org/article/limited-english-proficient-population-united-states.

56   Carmen DeNavas-Walt and Bernadette D. Proctor, "Income and Poverty in the United States: 2013," *U.S. Census Bureau*, September 2014, (*PAGE 51) https://www.census.gov/content/dam/Census/library/publications/2014/demo/p60-249.pdf.

57   Jie Zong and Jeanne Batalova, "The Limited English Proficient Population in the United States," *Migration Policy Institute*, July 8, 2015, http://www.migrationpolicy.org/article/limited-english-proficient-population-

united-states.

58 Ibid.

59 Alliance for Excellent Education, *Double the Work* (2007), 10, https://www.carnegie.org/media/filer_public/bd/d8/bdd80ac7-fb48-4b97-b082-df8c49320acb/ccny_report_2007_double.pdf.

60 http://www.ncld.org/understanding-learning-and-attention-issues.

61 Candace Cortiella and Sheldon H. Horowitz, "The State of Learning Disabilities: Facts, Trends and Emerging Issues," *New York: National Center for Learning Disabilities*, 2014, 3-5, https://www.ncld.org/wp-content/uploads/2014/11/2014-State-of-LD.pdf.

62 Ann Logsdon, "Help for Reading Comprehension Learning Disabilities," *Verywell*, last modified April 13, 2017, https://www.verywell.com/learning-disability-in-reading-comprehension-2162449.

63 Candace Cortiella and Sheldon H. Horowitz, "The State of Learning Disabilities: Facts, Trends and Emerging Issues," *New York: National Center for Learning Disabilities*, 2014, 25, https://www.ncld.org/wp-content/uploads/2014/11/2014-State-of-LD.pdf.

64 http://www.ncld.org/understanding-learning-and-attention-issues.

65 Candace Cortiella and Sheldon H. Horowitz, "The State of Learning Disabilities: Facts, Trends and Emerging Issues," *New York: National Center for Learning Disabilities*, 2014, 25, https://www.ncld.org/wp-content/uploads/2014/11/2014-State-of-LD.pdf.

66 "New to LD," *Learning Disabilities Association of America*, accessed June 22, 2017, https://ldaamerica.org/support/new-to-ld/.

67 http://www.ncld.org/understanding-learning-and-attention-issues.

68 http://www.ncld.org/understanding-learning-and-attention-issues.

69 http://www.ncld.org/understanding-learning-and-attention-issues.

70 http://www.ncld.org/understanding-learning-and-attention-issues.

71 Jenna Flannigan, "How Prison Literacy Programs Can Fix America's Mass Incarceration Problem," *GOOD and Pearson*, December 18, 2015, https://www.good.is/articles/prison-literacy-programs-help-break-incarceration-cycle.

72 National Center for Education Statistics, *Highlights from the U.S. PIAAC Survey of Incarcerated Adults: Their Skills, Work Experience, Education, and Training* (2014), 6, https://nces.ed.gov/pubs2016/2016040.pdf.

73 "Literacy Statistics," Begin to Read, accessed August 9, 2017, http://www.begintoread.com/research/literacystatistics.html.

74 National Center for Education Statistics, *Literacy Behind Bars* (2007), https://nces.ed.gov/pubs2007/2007473.pdf.

75 Christy A. Visher, Laura Winterfield, and Mark B. Coggeshall, "Ex-offender employment programs and recidivism: A meta-analysis," *Journal of Experimental Criminology* 1, no. 3 (2005): 295-316, https://link.springer.com/article/10.1007/s11292-005-8127-x.

76 Stephen J. Tripodi, Johnny S. Kim, and Kimberly Bender, "Is Employment Associated With Reduced Recidivism?" *Sage Journals* 54, no. 5 (2010): 706-720, http://journals.sagepub.com/doi/10.1177/0306624X09342980.

77 "Literacy Statistics," Begin to Read, accessed August 9, 2017, http://www.begintoread.com/research/literacystatistics.html.

78 Alia Wong, "How Parental Incarceration Affects a Child's Education," *The Atlantic*, November 11, 2015,

https://www.theatlantic.com/education/archive/2015/11/how-parental-incarceration-affects-a-childs-education/414720/.

79 Melinda D. Anderson, "How Mass Incarceration Pushes Black Children Further Behind in School," *The Atlantic*, January 16, 2017, https://www.theatlantic.com/education/archive/2017/01/how-mass-incarceration-pushes-black-children-further-behind-in-school/513161/

80 Child Trends, *Parents Behind Bars: What Happens to Their Children?* (2015), https://www.childtrends.org/wp-content/uploads/2015/10/2015-42ParentsBehindBars.pdf. ***

81 Alia Wong, "How Parental Incarceration Affects a Child's Education," *The Atlantic*, November 11, 2015, https://www.theatlantic.com/education/archive/2015/11/how-parental-incarceration-affects-a-childs-education/414720/.

82 http://www.ncld.org/understanding-learning-and-attention-issues.

83 Olga Khazan, "Half of All Kids are Traumatized," *The Atlantic*, December 11, 2014, https://www.theatlantic.com/health/archive/2014/12/half-of-all-kids-experience-traumatic-events/383630/.

84 http://www.ncld.org/understanding-learning-and-attention-issues.

85 Alia Wong, "What Are Massachusetts Public Schools Doing Right?," *The Atlantic*, May 23, 2016, https://www.theatlantic.com/education/archive/2016/05/what-are-massachusetts-public-schools-doing-right/483935/.

86 https://nces.ed.gov/naal/estimates/StateEstimates.aspx.

87 Alia Wong, "What Are Massachusetts Public Schools Doing Right?," *The Atlantic*, May 23, 2016, https://www.theatlantic.com/education/archive/2016/05/what-are-massachusetts-public-schools-doing-right/483935/.

88 Reading is Fundamental, *Reading is Fundamental 2016 Annual Report* (2016), http://www.rif.org/media/RIF_Annual_Report_2016_Low_Res_Final_v2.pdf.

89 Barbara Culatta, interviewed by Alyssa Clark, Professor of Communication Disorders at Brigham Young University, June 16, 2017, Brigham Young University.

90 *What We Do*, ProLiteracy, accessed June 23, 2017, https://www.proliteracy.org/What-We-Do/Overview.

91 *Workforce Curriculum for Immigrants with Limited English*, ProLiteracy, accessed June 23, 2017, https://www.proliteracy.org/What-We-Do/Programs-Projects/Workforce-Curriculum-for-Immigrants-with-Limited-English.

92 *Countries*, Alfalit, accessed June 23, 2017, https://english.alfalit.org/country/.

93 National Literacy Directory, accessed June 22, 2017, https://www.nationalliteracydirectory.org/.

94 Eva Witesman and Andrew Heiss, "Nonprofit Collaboration and the Resurrection of Market Failure: How a Resource Sharing Environment Can Suppress Social Objectives," *Voluntas: International Journal of Voluntary and Nonprofit Organizations* (2016), DOI: 10.1007/s11266-016-9684-5.

95 *Results*, ProLiteracy, accessed June 23, 2017, https://proliteracy.org/What-We-Do/Results.

96 ProLiteracy, *Annual Statistical Report* (2015-2016), accessed June 23, 2017, https://proliteracy.org/Portals/0/AMR%202017%20FINAL.pdf?ver=2017-06-01-161750-887.

97 *News and Press Releases: Costa Farms Graduation*, Alfalit, July 15, 2015, https://english.alfalit.org/press-release-costa-farms-graduation/.

98 *Countries*, Alfalit, accessed June 23, 2017, https://english.alfalit.org/country/.

99 National Literacy Directory, accessed June 22, 2017, https://www.nationalliteracydirectory.org/.

100   Eva Witesman and Andrew Heiss, "Nonprofit Collaboration and the Resurrection of Market Failure: How a Resource Sharing Environment Can Suppress Social Objectives," *Voluntas: International Journal of Voluntary and Nonprofit Organizations* (2016), DOI: 10.1007/s11266-016-9684-5.

101   RAND Corporation, *How Effective Is Correctional Education and Where Do We Go From Here?* (2014), xiv, https://www.rand.org/content/dam/rand/pubs/research_reports/RR500/RR564/RAND_RR564.pdf.

102   Vera Institute of Justice, *Expanding Access to Postsecondary Education in Prison: Fact Sheet* (2017), https://storage.googleapis.com/vera-web-assets/downloads/Publications/postsecondary-education-in-prison-fact-sheet-for-correction-leaders/legacy_downloads/postsecondary-education-in-prisonfactsheet-for-corrections-leaders.pdf.

103   RAND Corporation, *How Effective Is Correctional Education and Where Do We Go From Here?* (2014), xiv, https://www.rand.org/content/dam/rand/pubs/research_reports/RR500/RR564/RAND_RR564.pdf

104   Ibid, iii.

105   Ibid, xxi.

106   Jenna Flannigan, "How Prison Literacy Programs Can Fix America's Mass Incarceration Problem," *GOOD and Pearson*, December 18, 2015, https://www.good.is/articles/prison-literacy-programs-help-break-incarceration-cycle.

107   "Global Literacy," Benetech, accessed August 10, 2017, https://www.benetech.org/our-programs/literacy/.

108   "Andrew Kay," Skoll, accessed August 10, 2017, http://skoll.org/contributor/andrew-kay/.

109   Karen E. Forgrave, "Assistive Technology: Empowering Students with Learning Disabilities," *The Clearing House: A Journal of Educational Strategies, Issues and Ideas* 75, no. 3 (2002): 122-126, http://dx.doi.org/10.1080/00098650209599250,

http://www.tandfonline.com/doi/pdf/10.1080/00098650209599250?needAccess=true.

110   Charles A. MacArthur, "Using Technology to Enhance the Writing Processes of Students with Learning Disabilities," *Sage Journals* 29, no. 4 (2016): 344-354, http://journals.sagepub.com/doi/pdf/10.1177/002221949602900403.

111   Matthew L. Love, Tracy G. Spies, and Joseph J. Morgan, "Using E-Books to Acquire Foundational Academic Vocabulary," *Intervention in School and Clinic*, March 27, 2017, doi: 10.1177/1053451217693368, http://journals.sagepub.com/doi/pdf/10.1177/1053451217693368.

112   Alan M. Lesgold and Melissa Welch-Ross, *Improving Adult Literacy Instruction: Options for Practice and Research* (Washington DC: National Academies Press, 2012), 399 https://www.nap.edu/read/13242/chapter/14#399.

113   Ibid.

114   Ibid.

115   Juanita Giles, "E-books are not the answer to a literacy crisis," *The Washington Post*, March 25, 2016, https://www.washingtonpost.com/opinions/e-books-are-not-the-answer-to-a-literacy-crisis/2016/03/25/3d093152-f112-11e5-a61f-e9c95c06edca_story.html?utm_term=.878b2bcbec18.

116   U.S. Citizenship and Immigration Services, "Education and Child Care," accessed July 13, 2017, https://www.uscis.gov/tools/settling-us/education-and-child-care.

117   Barbara Culatta, interviewed by Alyssa Clark, Professor of Communication Disorders at Brigham Young University, June 16, 2017, Brigham Young University.

118   Sarah Katherine K. Moore, Molly Fee, Jongyeon Ee, Terrence G. Wiley, and M. Beatriz Arias, "Exploring

Bilingualism, Literacy, Employability and Income Levels among Latinos in the United States," https://books.google.com/books?hl=en&lr=&id=2mllBAAAQBAJ&oi=fnd&pg=PA45&dq=related:psSjIoc3wcxCHM:scholar.google.com/&ots=nD9kWIcx5q&sig=rbr9TmQxOc1qALtEOnn1U0CNDdc#v=onepage&q&f=false.

119   http://www.immigrantinfo.org/borders/esl.pdf.

120   Susan L. Schalge and Kay Sogo, ""Then I Stopped Coming to School": Understanding Absenteeism in an Adult English as a Second Language Program," *Adult Basic Education and Literacy Journal* (Fall 2008):156-159, http://www.nelrc.org/persist/pdfs/Schalge_0708.pdf.

121   National Research Council, *Improving Adult Literacy Instruction: Developing Reading and Writing* (Washington, DC: The National Academics Press, 2012), 9, doi: 10.12336/13468, https://www.nap.edu/read/13468/chapter/5.

122   National Research Council, *Improving Adult Literacy Instruction: Developing Reading and Writing* (Washington, DC: The National Academics Press, 2012), 7, doi: 10.12336/13468, https://www.nap.edu/read/13468/chapter/4#7.

123   Brian Jacob, "When Evidence is Not Enough: Findings from a Randomized Evaluation of Evidence-Based Literacy Instruction (EBLI)," NBER Working Paper No. 21643, October 2015, 23–24, https://www.povertyactionlab.org/sites/default/files/publications/3881%20EBLI%20NBER%20Oct2015.pdf.

124   Ibid.

125   Barbara Culatta, interviewed by Alyssa Clark, Professor of Communication Disorders at Brigham Young University, June 16, 2017, Brigham Young University.

126   Daphne Greenberg, Justin Wise, Robin Morris, Laura Fredrick, Alice O. Nanda, and Hye-K. Pae, "A randomized control study of instructional approaches for struggling adult readers," *PMC* 4, no. 2, (2011) DOI: 10.1080/19345747.2011.555288.

127   Judith A. Alamprese, Charles A. MacArthur, Cristofer Price, and Deborah Knight, "Effects of a Structured Decoding Curriculum on Adult Literacy Learners' Reading Development," PMC 4, no. 2, (2011), 154-172, DOI: 10.1080/19345747.2011.555294.

128   John Comings and Lisa Soricone, "Adult Literacy Research: Opportunities and Challenges," *National Center for the Study of Adult Learning and Literacy Harvard Graduate School of Education* (2007), 24-25, http://files.eric.ed.gov/fulltext/ED495439.pdf.

129   Ibid.

130   Brian Jacob, "When Evidence is Not Enough: Findings from a Randomized Evaluation of Evidence-Based Literacy Instruction (EBLI)," NBER Working Paper No. 21643, October 2015, 23-24, https://www.povertyactionlab.org/sites/default/files/publications/3881%20EBLI%20NBER%20Oct2015.pdf.

131   John Comings and Lisa Soricone, "Adult Literacy Research: Opportunities and Challenges," *National Center for the Study of Adult Learning and Literacy Harvard Graduate School of Education* (2007), 18, http://files.eric.ed.gov/fulltext/ED495439.pdf.