Seattle Goodwill
DIGITAL LITERACY INITIATIVE

Technology Access, Usage, & Digital Literacy: Issues & Strategies

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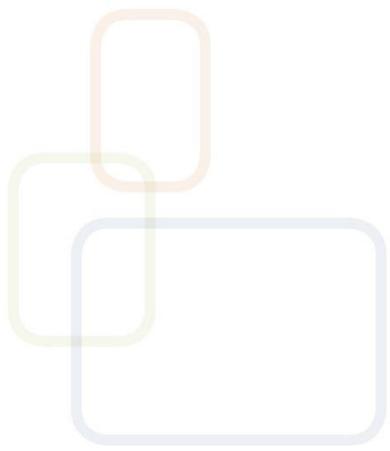
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Technology Access, Usage, and Digital Literacy: Issues and Strategies

Internet and technology access as well the skills to harness these resources are becoming increasingly necessary for participation in employment, education, community and civic activity. As a part of Seattle Goodwill's Digital Literacy initiative, we surveyed available research on national, state, and local findings about internet and technology access to provide context for our project and the needs of students we serve. In addition to overall access statistics for the nation, Washington state and Seattle, we paid special attention to those factors identified in the literature as potential barriers to technology adoption, including income and education level, age, language—factors particularly relevant for Goodwill students. We then looked at some international survey results regarding the impact of skill levels in "technology-rich environments" on employment and wages. Finally, we explored local efforts to address technology skills needs. We finish with a description of Seattle Goodwill's current and upcoming programs integrating digital literacy.

What we found suggests that while access to the internet and technology tools is a crucial prerequisite for learning and advancement, it is the acquisition of transferable digital skills that has critical impact on employment and self-sufficiency wage opportunities for individuals.

This report focuses on these major themes:

- Research on Internet Access and Technology Usage
- From Access and Usage to Digital Literacy and Skills
- Local Program Offerings in the Seattle Metro Area
- Seattle Goodwill's Program Offerings

Internet Access and Technology Usage

As part of Goodwill's digital literacy initiative, a survey was administered to Job Training and Education department students to provide more information about their access to internet, technology device usage, and the types of activities they do with devices. Though our survey showed more access than we expected*, the device usage was lower than overall local, state, and national rates, and there were some significant gaps in types of activities performed, especially between our native and non-native English speakers.

The averaged demographic statistics about our students provides a basic point of comparison with the information to follow below and is compatible with similar populations described in Pew research.

Seattle Goodwill Average Student Profile
- Average Household Income – $21,458
- Average Age – 43
- Households with Children – 44%
- High School Education or Below – 58%
- Immigrant or Refugee – 57%
- Student of Color – 70%

The definition and issue of access has become more complicated than whether a consumer receives broadband services at home or not. Much of the information we found refers to broadband, but these days many people access the internet on smart phones or other devices, or at public facilities such as libraries. When additional factors such as types of data plans and geography are considered, the concepts of "accessing" the internet, "using" the internet and "having [vs. owning] access" to the internet become harder to pinpoint and compare. However, the table below gives some indications of differences among these population groupings:

	Nation Overall	Washington State Overall [1]	City of Seattle Overall [2]	Seattle Goodwill Students
Internet	70% have home broadband / 85% use the internet [3]	84% have internet access at home / 88% use broad-band from any location	85% have "some" internet access at home / 89% use the internet	75% access internet at home*/ 94% access the internet from some location
Smartphone	58% own smartphone [4]	67% have "hand-held computers" (phones/ tablets/or wearable devices) [5]	66% use smartphone	43% use smartphone
Tablet	42% own tablet [6]		40% (phone survey) /66% (online survey) use tablet	22% use tablet

*This percentage increases to 83% if smartphones are considered a type of home access.

Research on Access

There is an increasing recognition among the public that lack of access to technology and the internet corresponds to lack of opportunities, and that those without access "*are at a major disadvantage when it comes to finding out about job opportunities or learning career skills, or when getting health information, learning new things for personal enrichment, and using government services.*" [7]

Research and literature generated over the last decade indicates that several factors tend to impact internet access, including **income, age, education, geography and language (see below).**

Demographic groups with the highest rates of home broadband adoption are college graduates, adults under age 50, and adults living in households earning at least $50,000, as well as whites and adults living in urban or suburban areas. [8]

Income, Education & Age

In general, less income and education tend to correspond to lower access levels, and as age increases, internet access and use decrease:

	Use the Internet		
Income	**National [9]**	**Seattle [10]**	**Goodwill Students**
Less than 20K/yr	60+% *	74%	94%
Less than 30K/yr	76%	79%	
75K/yr or above	96%	92-98%	

*At least 30% do not go online at all (mostly older adults) [11]

	Use the Internet		
	National [12]	Seattle [13]	Goodwill Students
Education			
Less than High School	59%	57%	94%
High School Graduate	78%	75%	
College Degree	96%	95%	
Age			
18-29	98%	96% (18-25)	98% (15-25)
30-49	92%	94% (26-35) 93% (36-50)	97% (26-40) 93% (41-55)
50-64	83%	90% (51-64)	90% (56+)
65+	56%	66%	

Of Goodwill students who took the survey, 59% were aged 41 and over, and as noted above, the average income is well below $30,000 per year and over half do not have a high school diploma. National and regional statistics would point to lower levels of use for people with these traits, but it does not seem to hold true for Goodwill students.

Geography

An article in *The Atlantic Cities* features broadband access maps of 10 major cities, showing a pattern that recurs in many cities: access is high in the downtown and suburb areas, but not as much in inner-city neighborhoods. In public libraries, people who otherwise have no access at home primarily access the internet for employment or education searches, health information, or banking services. "At stake isn't the ability to stream [TV shows]. It's the ability to participate fully in a society that's increasingly moving online." [14]

Data shows that older, less educated, poorer, and rural populations have lower internet user rates. For instance, referring to U.S. Census Current Population Survey household-level data, the Washington State Broadband Report states broadband adoption gap between metro and non-metro areas remained at 13 percentage points in both 2003 and 2010; however, this gap increased among low income, low-education, and elderly populations. [15]

Public Access (Library Use)

Resorting to internet access at the library is often related to income and geographic proximity.

- Two-thirds of those using internet at public library said that they did research for school or work [16]
- 16 to 17 year olds were the group to access the internet the most. About 39% of them said that they had used a library computer or Wi-Fi in the last 12 months [17]
- For those aged 30 to 49, it was 31% [18]

Anecdotal feedback gathered in these studies emphasized the challenges of relying solely on public access, due to time limitations on computer reservations, library open hours, and logistics of getting there.

Race & Native Language

The Pew Research Center's Internet and American Life Project web site outlines additional factors associated with internet access such as race and language-speaking preference:

- 24% of Latinos are not online, versus 14% whites and 15% African Americans [19]
- "English-speaking Latinos are almost identical to whites in their use of the internet and home broadband; however, foreign-born and Spanish-dominant Latinos dramatically trail not only whites but also native / English-speaking Latinos on both points. Indeed, [English] language proficiency is one of the most powerful predictors of internet use, even controlling for other demographic factors" [20]

At Seattle Goodwill, over 100 native languages are represented among students; 65% of students who took our survey are non-native English speakers. Recognizing the challenges of learning technology without sufficient language skills, our initial focus for the digital literacy project will be the ESOL (English for Speakers of Other Languages) classes.

Mobile Technology

Groups that have often had less basic internet access are now using wireless connections to go online:

- Among smartphone owners, young adults, minorities, those who have not attended college, and those with lower household income are more likely than other groups to report their phone as their main source of internet access [21]
- Both African Americans and English-speaking Latinos are as likely as whites to own any sort of mobile phone and are more likely to use their phones for a wider range of activities [22]
- Both African American and English-speaking Latinos are more likely to own a mobile phone than whites [23]
- Foreign-born Latinos have less cell phone ownership than their Native-born counterparts, but the gap is notably smaller than the gap in internet use between these groups [24]

Seattle's recent technology survey indicated a growth in the number of residents with smartphones from 35% in 2009 to 58% in 2013. [25] Goodwill recognizes the need to integrate mobile technology skills into its program, since for many students it is a significant and growing form of access to the internet.

Seattle Goodwill Research on Student Access & Usage

As part of Goodwill's digital literacy initiative, a survey was administered to Job Training and Education department students to provide more information about access to internet, technology device usage, and the types of activities participants do with devices. Surveys were completed by 85% of active students during the survey administration period.

Access to Internet: Student access is higher than assumed, with a high percentage (**83%**) of students accessing the internet at home and/or by smartphone.

- 75% access the internet at home
- Only 4% do not access the internet at all
- 67% access internet daily from at least 1 location
- 27% only access internet in a mix of weekly and monthly from various locations (no daily access)

Device Usage: Overall, 92% of students use at least 1 internet capable device in personal or public setting like Goodwill.
- Over half the students use a laptop computer, and about half use a desktop computer
- 43% use a Smart Phone
- 22% use tablets

Activities: For the most part, students have used technology to perform communication and entertainment related tasks more than employment and education related tasks.

- About 70% of all surveyed students use these devices to send email, watch videos, or listen to music
- Just over 50% have applied to jobs online
- 32% have used an internet capable device at a job
- 45% have used an internet capable device to do school work outside of class

There are significant differences (10%-33%) between native and non-native English speakers for many of the internet activities and tasks surveyed such as using a computer on the job, applying for jobs online, doing classwork outside of class, shopping online and sending email. With the exception of social media, the disparities in internet-based activities are even greater compared to overall Seattle city data:

Activity	Goodwill Native English Speakers	Goodwill Non-Native English Speakers	Seattle Overall phone survey/online survey
Search for jobs	82%	45%	-----
Apply for jobs	73%	40%	-----
Work at jobs	49%	23%	57% / 65%*
Take class/training online	42%	29%	46% /61%
Do class work outside of class	61%	37%	-----
Check a bank balance	49%	39%	-----
Shop online	61%	35%	81% /97%
Send email	84%	62%	87% /97%
Facebook or other social media	65%	54%	66% / 59%
Get a file/app from internet	57%	36%	66% /81%**

*Includes jobs and job training
**These percentages refer to participants who said they are "very comfortable" doing this task.

One conclusion reached by Seattle's survey is that "There is still a significant gap in access to internet and the skills to use it, though the digital equity gap is more focused in skills and uses of the internet than on basic access." [26]

Many of Goodwill's students fit the demographics of those with less access described in the research above. Though we found in our survey that access is higher than expected, we found that there are disparities in how technology is used, especially in our non-native English speaking populations. *(For more details, the **Internet Access & Technology Usage Survey Results** full report.)*

From Access and Usage to Digital Literacy

There are increasing efforts and attention aimed at helping increase access to internet and tools. Companies such as Comcast offer subsidized access to low-income customers, and community based organizations work to connect clients with resources such as low-cost cell phones and computers. Even the White House is pushing to increase internet connectivity in schools across the nation. [27]

But access to technology alone is not enough: people also need the skills and digital literacy to take advantage of technology's potential and become more ready for work and further education.   Goodwill's survey results showed higher than expected access to the internet and usage of internet capable devices. The survey also described how students are using the technology and resources available to them, but not the level of proficiency or comfort.

International Research on Adult Skills

The Organisation for Economic Co-operation and Development (OECD) put together the Survey of Adult Skills, an international survey conducted in over 20 countries (and included 5000 respondents in the U.S.) as part of the Programme for the International Assessment of Adult Competencies (PIAAC). The assessment measures the "proficiency of adults in key information processing skills essential for the participation in the information-rich economies and societies of the 21st century. These skill domains are: **literacy**, **numeracy**, and **problem solving in technology-rich environments**." First results were released in October of 2013. The project gathered a broad range of information, including how skills are used at work and in other contexts, such as the home and the community. [28]

Results for the U.S. include the following key findings:

- U.S. adults scored below the international average in all three domains [29]
- Adults in the United States who demonstrated low skill levels in PIAAC are broadly distributed across our adult working-age population **[30]**
- Some demographics of low-skilled adults: one-third are aged less than 35; one-third are immigrants; more than half are African-American or Latino [31]
- Skill level is correlated with success in the labor market. When looking at employment rates among U.S. participants with a high school degree, those who performed at higher proficiency levels reported higher employment rates than those who performed at lower proficiency levels [32]

Problem Solving in Technology-Rich Environments

PIAAC defines problem solving in technology-rich environments as *"using digital technology, communication tools, and networks to acquire and evaluate information, communicate with others, and perform practical tasks."* [33] Its main features include:

- "Knowledge of how various technological environments are structured (e.g., an understanding of the basics of the environment, including how to use command names, drop-down menus, naming protocols for files and folders, and links in a web page)
- Ability to interact effectively with digital information; understand electronic texts, images, graphics, and numerical data; and locate, evaluate, and critically judge the validity, accuracy, and appropriateness of the accessed information" [34]

For the assessment, OECD/PIACC developed a scale of proficiency levels for problem solving in technology-rich environments. Adults scoring at the highest level (Level 3) were able to solve complex multi-step problems using information analysis, critical thinking, and multiple digital tools and resources, to overcome unexpected hurdles or difficulties, and to self-monitor milestones and progress towards the completion of the problem. Adults scoring at the lowest level (Below Level 1) were only able to solve simple, well defined problems using a single digital tool or resource without the need for critical thinking or reasoning. The results below indicate percentages of adults scoring at each level. (See full level and task descriptions in Appendix A.)

PIAAC proficiency level scores on the problem solving in technology-rich environments scale [35]

Level 3	In the U.S. 6% of adults, and on average across countries 8% of adults score at Level 3.
Level 2	In the U.S. 33% of adults, and on average across countries 37% of adults score at Level 2.
Level 1	In the U.S. **41%**, and on average across countries 39% of adults score at Level 1. (tasks involve few steps using widely familiar technology with little navigation; apply explicit criteria to problems and use simple reasoning)
Below Level 1	In the U.S. 20% of adults, and on average across countries 16% of adults score below Level 1.

As noted above in the PIACC survey key findings, labor market success correlates with level of skill proficiency. For "problem solving in a technology rich environment," as the levels of proficiency increased the percentage of people who were employed increased, while the percentage of those out of the workforce decreased.

Employment Rates Across Proficiency Levels [36] (see full level descriptions in Appendix A)

Level	Employed	Unemployed	Out of Labor Force
Below Level 1	59%	5%	36%
Level 1	74%	9%	17%
Level 2	79%	7%	14%
Level 3	83%	6%	12%

Likewise, the top end of pay ranges for each proficiency level goes up significantly for higher proficiency levels:

Wage Distribution Across Proficiency Levels [37] (see full level descriptions in Appendix A)

Level	Wage Range
Below Level 1	$8 -$16 / hour
Level 1	$11 - $24 / hour
Level 2	$13 - $33 / hour
Level 3	$15 - $40 / hour

Adults scoring on the lower end of the scale may have basic computer skills, but as can be seen in the employment rates and wage distributions above, much higher problem solving skills in technology rich environments are needed to ensure personal employment security and the potential for wage progression.

Consistent enrollment in Goodwill's computer classes demonstrates the community's desire to attain the skills needed to compete and succeed in work and further education. Beyond hard computer skills, employing effective, flexible cognitive strategies on real life problems/tasks that are often unstructured and undefined is required to advance in today's workplace and society. The PIACC study has been influential in how we see digital literacy and the development of our framework for teaching and learning.

Seattle Goodwill's definition of digital literacy is much broader than basic computer skills and is described as the knowledge, skills, and attitudes to effectively navigate, critically evaluate, create or adapt information using a range of digital technologies (independently or collaboratively) to accomplish authentic, relevant goals. In addition to the traditional basic skills of reading, writing, and math, digital literacy is now also a "basic skill."

As part of this project we explored local programs to promote technology skills and digital literacy among higher need groups. We found some interesting efforts that leverage existing resources and introduce innovative approaches.

At the 2013 Digital Inclusion Summit held in Seattle, Laura Breeden, program director in the Department of Commerce) and leader of the Broadband Technology Opportunities Program (BTOP) stressed the importance of community partnerships to bring about the needed changes to make access and digital literacy possible. [38] Our outreach and sharing of this project with other organizations will hopefully contribute to more community networking, cross-referrals, and future partnerships.

Seattle Metro Area Community Interviews

As part of our research we contacted and interviewed various local community-based organizations, community colleges, and city officials to learn more about other programs and strategies aimed at increasing digital literacy. Because of the higher reported needs of non-native English speakers, we focused much of our information gathering towards approaches the focused on integrating digital literacy and technology skills with English language instruction. We tried to get a sense of what seems to work well, what challenges there are, and how local efforts fit together or relate to one another.

Our conversations focused on the following topics:

- Strategies and program offerings
- Perceptions of student technology access and needs
- Professional development for staff
- Technology considerations for orgs
- Partnerships supporting technology
- Recommended resources (see Program Implementation Guide appendix)

Below is a summary of some key points gleaned from our research. Though there are various approaches being tested, staff at the organizations below all acknowledged the necessity of addressing technology integration for their immigrant and ESL students/clients in order to help them be successful.

Community Strategies and Program Offerings

"Flipped" Instruction:
OneAmerica, an organization in Seattle that advocates for immigrant, civil and human rights, developed the English Innovations program, in which students were loaned laptops with wireless cards to use while enrolled in the program. Instruction was "flipped" in that students learned content using online resources, and then did their homework and projects during class time to work with other students and get teacher help. They used "LiveMocha," an online English language learning resource structured in a social media format, like FaceBook. Class time was facilitated by a Tech Coach and volunteers, who completed an online training program. Volunteers also utilized Skype to give students help outside of class. In their summary report, they said that gains in language/literacy skills was measured with standardized pre- and post-test, and that results showed gains at or above the Washington State average, with the added bonus of acquiring technology and digital literacy skills. The program was funded by a Gates Foundation grant.

Staff at two Seattle community colleges and the state board for community and technical colleges described a similar class model they are piloting. The "I-DEA" (Integrated Digital English Acceleration) project currently involves 10 colleges in the state, with the plan being to expand to more schools after this pilot year. The technology infused ESL classes consists of 30 themed week-long modules, divided up into 3 academic quarters. Language content is embedded within the context of each theme, and themes can be introduced in any order; the format is project/problem-based. The model requires 50% time face to face, and 50% of class time online. Students are loaned laptop computers with wireless cards to use for the class. The goal of the project is to combine digital literacy, ESL skills, and personal skills in an accelerated format that could lead to ABE studies and college/career pathway options later. One requirement of the I-DEA grant is for colleges to partner with community-based organizations for services such as technology coaching, job training, childcare, etc.

Staff feedback regarding the early quarters of the program included concerns about mixing ESL levels, the fast pace of the themed modules, and some found it challenging to manage the technology integration in the allotted class structure, especially for lower ESL level students. However, overall they saw student access to the laptops and online resources as positive and one group reported seeing more basic digital literacy among the ESL students. The IDEA project is funded by the Gates Foundation.

ESL Computer Classes:
Organizations like Literacy Source offer both traditional ESL classes as well as basic computer classes geared toward ESL students, including more work on vocabulary and a slower pace to allow for language differences. Staff at a couple of community colleges spoke of faculty working to add technology outcomes to their regular ESL classes.

Dedicated Lab Time:
Staff at Edmonds Community College said they have designated computer labs times for lower-level computer users and higher-level computer users. One challenge noted was that wi-fi on campus is weak.

Computer Assisted Language Learning (CALL):
Seattle Central Community College has offered a "CALL" class to supplement regular ESL classes. These classes include basic computer skills, using links to community resources, and accessing online ESL resources. Each class includes an optional dedicated hour of lab time each week.

Library Technology Programs:

The Seattle Public Library (SPL) has offered various types of classes, such as computers for seniors, Russian speakers, ESL classes and conversation practice groups, basic computer skills. SPL is consistently updating the offerings to keep current with community needs.   In addition to classes, SPL has many open computer stations and labs which are open to community.

Staff at Central Oregon Community College described their library hardware lending program, in which students can check out devices such as laptops, tablets, cameras, e-readers, and digital voice recorders. They commented that it has gone well with minimal problems related to equipment damage or theft. They also described the "Information Fluency" taught as part of their library use classes: critical thinking, analytical and evaluation skills, credible vs. non-credible sources.

Tablets in K-12:

The Technology Services Manager for the Seattle Public School District shared some information about technology in the K-12 system. He noted how iPads, netbooks and laptops are being used in many classrooms more and more for "productivity" tasks, like working with databases, making movies, taking pictures, or doing presentations rather simply teaching how to use the technology.   He highlighted how tablets work well for working with video and pictures as well as using the recording features for language practice and review. An instructor with the district expressed the need to give students guidance for using technology beyond its entertainment features. The district has many technology-related partnerships such as Microsoft sponsored programming classes and various mini-grants.

Community Computing Centers:

The City of Seattle has addressed technology needs on several fronts. Their strategies are informed by the digital inclusion framework of Access-Literacy-Content. Examples of access include public computing centers, assistive technology, and tech support. Literacy includes teaching skills, while "content" includes meaningful info and services that are culturally appropriate, so that users can find local resources and have the ability to produce and distribute information. The City is in a position to influence policy and cable franchising which gives them a powerful tool when it comes to increasing access to the internet for citizens. The City also conducted a survey of residents (detailed above) regarding their technology access and usage, as well as bringing community groups together at events to discuss local technology needs.

Comments and Suggestions from Community Interviews

Staff Perceptions about Student Access & Needs

- Check Assumptions: student access to phones and data plans may not be consistent; devices like smart phones may be underutilized
- Students may need help accessing hardware and the internet, library use not always feasible
- Students need guidance for tasks beyond entertainment functions
- Students need to overcome their fear of damaging equipment
- Students need focus on transferable skills; basics and language of technology
- Students don't get enough experience installing programs, apps for themselves
- Staff need to plan for iterative learning when designing instruction
- Consider cultural norms when planning programs and services

Professional Development for Staff
- Instructors need training, lesson materials (especially for lower level ESL) and repository, tools
- Staff need lead time to get comfortable with new technology
- Teacher technology competencies and class behaviors need to be spelled out
- Internal staff learning communities can be a good way to provide ongoing support
- When planning outcomes, start small and get staff buy in

Technology Considerations
- Be sure to involve the IT staff who will support the project in the planning process from the start; make sure all parties understand the needs and concerns of the others
- Ensure that necessary Wi-Fi / internet access can meet the demands of the project/program
- When scaling up to multiple sites, work towards consistency across sites (tools, applications, security, policies, training)
- Plan for sustainability. If project start up relies up grants, plan for continued funding from external sources or internal budget; plan for necessary hardware/software upgrades and periodic evaluations

Partnerships Supporting Technology
- Funding (hardware, software, training, program development) examples: Gates Foundation, state higher education boards, tech companies like Comcast, Microsoft
- Coordinate with other organizations for support services, facilities, training, etc. Synergize efforts and resources, such as between colleges and CBOs for the I-DEA project
- Organize round-tables and summits to bring local providers together
- Think creatively about alliances, for example with Parks and Recreation or the Institute for Museums and Libraries, which helps communities plan for digital inclusion
- See if local universities can lend expertise (examples: Seattle University, University of WA Information School)

Seattle Goodwill's Digital Literacy Strategy

In order to ensure consistency in practice, we developed a digital literacy definition and framework to guide teaching and learning. It recognizes a continuum of proficiency, from basic exposure to skill building to cognitive strategies for problem solving on real-world tasks in technology-rich environments. The emphasis is on digital literacy integration into existing and future program offerings, not treating it as a stand-alone, separate subject.

Program Theory

Our Digital Literacy initiative will work to build on the technology exposure that students have already had while continuing to address students' needs for better access and more marketable skills. Being digitally literate is an ongoing process in which individuals must consistently keep up by actively learning and trying out new technology tools and resources, building skills with these technologies, and most importantly using these technologies to meet their needs and achieve their goals. This includes developing more digital "fluidity": learning cognitive strategies and underlying concepts that transfer from one form of technology to another so one can "figure out" something new on one's own.

That is why our definition goes beyond basic computer skills:

Digital literacy involves the knowledge, skills, and attitudes to effectively and critically navigate, evaluate, create or adapt information using a range of digital technologies (independently or collaboratively) to accomplish authentic, relevant goals.

For the purpose of this initiative, we have broken digital literacy into three phases:

1. Exposure and Exploration – Discovering and trying it out
2. Foundational Skill Building – Learning the "how-to" and practicing
3. 21st Century Skill Building - Putting it to use to solve real-world problems and achieve goals

To further explain these phases, we have formulated concrete competencies to guide teaching and learning:

Exposure and Exploration

- Understands basic digital literacy concepts and vocabulary
- Explores Hardware, Devices and Tools
- Explores Software, Programs, and Apps

Foundational Skill Building

- Builds hard skills needed to use tech tools
- Completes isolated tasks using software, programs, and apps
- Builds an awareness of online safety, privacy, and their digital footprint
- Uses online services and resources
- Searches for and locates information and resources online

21st Century Skill Building

- Uses digital communication tools and software to complete real world tasks
- Collaborates using digital tools and software to complete real world tasks
- Creates original products and content using digital tools and software
- Considers safety, privacy, appropriateness and digital footprint issues before using digital tools and making decisions online
- Analyzes and evaluates information and resources found online critically to make decisions
- Uses resourcefulness and self-direction to complete real world tasks using digital tools and software

It is important to note that individuals may be in different phases for different technologies at the same time. For example, an individual may be able to use email very proficiently in work and education settings, but may still need more education and practice with social media before they feel comfortable using it in similar settings. The key to keeping skills up to date is a willingness to keep learning new ways to integrate technology as it evolves. *For more information about our philosophy and digital literacy framework, see the* **Digital Literacy: Theoretical Framework** *document.*

Due to the disparities between native and non-native English speakers in having ever completed many of the tasks we surveyed, Goodwill will focus first on integrating more technology and digital literacy into our ESOL classes. As mobile devices are becoming more and more common and in some cases serve as a substitute for a laptop or desktop computer, Goodwill will work to implement a tablet program to help provide more exposure and skill building opportunities for students with mobile technology. Supporting staff through professional development will be important for successful integration. In addition to exposure and foundational skill building using technology, in the long term Goodwill seeks to increase our student's 21st century work readiness skills like collaboration, critical thinking, and problem solving through the digital literacy initiative.

Long Standing Strategies

Computer Access and Classroom Technology

For several years Seattle Goodwill has been expanding our use of technology with students at our Job Training and Education training centers. Grants and partnerships with major donors like Microsoft, Boeing, and Comcast have allowed us to teach students to use in-demand software, add teaching tools such as interactive whiteboards and document cameras, and develop lesson materials integrating technology into class content.

Each of our Job Training and Education Centers have at least one computer lab. Much of the current programming for increasing student digital literacy takes place in our computer labs. All of our other training rooms have at least one instructor computer and often possess a few additional computers, an interactive whiteboard, and a document camera. Some of our training centers also have computers in their lobby area for drop-in use. These computers provide a free access point for community members to learn and use technology.

Computer Courses

Our current computer course offerings include Computer Basics, ESOL Computer Basics, Online Job Search, Keyboarding, Internet and Email, and variety of courses focusing on the Microsoft Office Suite. Each training center offer supervised Open Computer Labs where students can work independently on building computer skills, searching for and applying for employment, or improving their English language skills with Rosetta Stone.

Language Learning Software

For the last 5 years, students in our ESOL classes have had access to Rosetta Stone to enhance their language learning. In July 2013, Rosetta Stone transitioned to a fully online service, and due to its popularity and effectiveness with our students, Goodwill continued its commitment to the software. As an online service, Rosetta Stone can now be accessed on any internet capable device including smartphones and tablets via the Rosetta Course app. Goodwill set a goal that each of students would complete 5 hours of Rosetta Stone per session and has made significant progress towards this goal in the last year. In addition to language learning, Rosetta Stone has provided exposure to computers and allowed students the opportunity to build their skills outside of a traditional computer class.

Support Services

All students participating in our Job Training and Education classes have access to case management and employment services.   Often these support services involve demonstrating and teaching students how to access online resources for transportation, public benefits, community resources, or jobs.   Our employment specialists are helping students build skills necessary to find and apply for jobs online.

Additionally, our case managers make efforts to help students obtain personal access to internet and cell phones/plans. This includes exploring low-cost internet options, and filling out the necessary paperwork, and in extreme cases helping students pay for internet access.

Learning Communities

Theme-based and subject area-based learning communities have been established to promote ongoing professional development for staff and continuous improvement of services to students. The groups foster a team-oriented reflective learning culture that shares knowledge, skills, and resources. The Technology Learning Community supported the implementation of new classroom technology tools in the learning centers during 2010-11. In addition to enhancing staff confidence using technology in the classrooms, the goals of this learning community were to positively impact student learning and engagement and increase student digital literacy and comfort learning with technology.   In 2013, the Digital Literacy Learning Community was formed and has served as a launching pad for the Digital Literacy Initiative. It has developed digital literacy integrated lesson plans and acted as an advisory group as the initiative has progressed.

New Strategies for Digital Literacy Initiative

ESOL Digital Literacy Pilot

Instead of creating special or supplemental classes which focus more heavily on technology and digital literacy, Goodwill is working to better integrate these skills into our current ESOL classes.   By integrating digital literacy skills into the current ESOL themes like employment and community, instructors can create authentic activities that students can apply immediately and directly into their everyday lives. We know that most job postings and applications are online, many community events and resources are posted on websites, and numerous ESOL resources can be accessed 24 hours per day online, so it is our responsibility to provide the skills needed to complete these real world tasks.

To accomplish this goal, Goodwill has a dedicated curriculum developer creating technology integrated lesson plans and working with staff to weave digital literacy into their current lesson plans. The lessons and activities cover a range of levels, integrate a variety of technologies, and provide a springboard for future lesson adaptations and activities incorporating digital literacy. These materials are being compiled into an online resource bank for instructors to share.

Mobile iPad Learning Labs

Mobile iPad Learning Labs for each of our Job Training and Education centers is a major component of integrating technology into our ESOL classes. The iPad lab can move from classroom to classroom and allows students in any class to have access to the internet and classroom applications outside of the computer lab.   In addition to this flexibility, mobile technology is becoming more and more pervasive, so iPads provide students with the opportunity to explore and build skills on the latest technology.   Touch screens also provide an experience that is often more user friendly for beginning computer users. Currently an iPad Lab is being piloted at our Seattle center with the intention to roll out to all ten centers by the end of the fiscal year.

Future Strategies

Goodwill plans to build on the experience of the ESOL pilot and work to better integrate digital literacy and technology into all of our program offerings.

GED

In the near term, our GED program will likely be the next subject area to have access to the iPad carts as well as an increased focus on digital literacy in lesson planning.   Due to changes in the GED which require students to test online, basic computer skills are now necessary to complete the GED.   Additionally, the test is requiring students to do more analysis and critical thinking, which are key components to being digitally literate.   More and more resources are now online to help students prepare for the test.   Goodwill has purchased iPathways, an online GED preparation course, to give students 24/7 access to study materials and is designed to work on iPad or other mobile devices.

Computer Courses

Goodwill currently offers a range of computer courses (described above), which are consistently well attended in our centers.   The courses provide many of the foundational skills needed to operate computers and software, but to better prepare students for the world of work and further education, more 21st century skills like critical thinking, problem solving, and collaboration need to be better incorporated in the course design. Students need to handle more complex problems and use self-direction to solve these problems in a way that mirrors the work environment.   Goodwill will be evaluating current classes and determining new offerings to meet this challenge.

Overall, these strategies can be used when considering our offerings at our centers:

- Adapting existing activities & materials to include more digital literacy skills & practice
- Making classes more student centered with digital literacy as a key approach
- Empowering more students to use more of the technology that is available at our centers

Goodwill will continue to work to build on the technology access and exposure that students have already had while continuing to address students' needs for better access and more marketable skills.

Appendix I

Description of PIAAC proficiency levels on the problem solving in technology-rich environments scale

Proficiency levels and cut scores for problem solving in technology-rich environments	Task Descriptions
Level 3	✓ Require the use of both generic and more specific technology applications. ✓ Some navigation across pages and applications is required to solve the problem. ✓ Use of tools (e.g., a sort function) required to make progress toward solution. ✓ Task may involve multiple steps and operators. ✓ In terms of cognitive processing, the problem goal may have to be defined by the person, and the criteria to be met may or may not be explicit, with typically high monitoring demands. ✓ Unexpected outcomes and impasses are likely to occur. ✓ Task may require evaluating the relevance and the reliability of information in order to discard distractors. Integration and inferential reasoning may be needed to a large extent.
Level 2	✓ Tasks typically require the use of both generic and specific technology applications. ✓ Some navigation across pages and applications is required to solve the problem. Use of tools (e.g., a sort function) can facilitate the resolution of the problem. ✓ Task may involve multiple steps and operators. ✓ In terms of cognitive processing, the problem goal may have to be defined by the person, though the criteria to be met are explicit. ✓ There are higher monitoring demands. ✓ Some unexpected outcomes or impasses may appear. ✓ Task may require evaluating the relevance of a set of items to discard distractors. Some integration and inferential reasoning may be needed.
Level 1	✓ Tasks typically require the use of widely available and familiar technology applications, such as email software or web browser. ✓ Little or no navigation required to access the information or commands required to solve the problem. ✓ Problem may be solved regardless of one's awareness and use of specific tools and functions (e.g., a sort function). ✓ Task involves few steps and a minimal number of operators. ✓ At a cognitive level, the person can readily infer the goal from the task statement; problem resolution requires one to apply explicit criteria; there are few monitoring demands (e.g., the person does not have to check whether they have used the adequate procedure or made progress toward the solution). ✓ Identifying contents and operators can be done through simple match; only simple forms of reasoning (e.g., assigning items to categories) are required; there is no need to contrast or integrate information.
Below Level 1	✓ Tasks are based on well-defined problems involving the use of only one function within a generic interface to meet one explicit criterion without any categorical, inferential reasoning or transforming of information. ✓ Few steps are required and no sub-goal has to be generated.

(Scale from Goodman, M., Finnegan, R., Mohadjer, L., Krenzke, T., and Hogan, J. (2013). *Literacy, Numeracy, and Problem Solving in Technology-Rich Environments Among U.S. Adults: Results from the Program for the International Assessment of Adult Competencies 2012: First Look* (NCES 2014-008). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Accessed from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2014008.)

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