

Public Policy Recommendations for Advancing Digital Social Equity in the United States

Excerpted from "Advancing Digital Social Equity Through the Application of Innovative Digital Literacy Programs" Authored by Daniel Theodore Ling Kent; Founder, Net Literacy; Haverford College; The Growth and Structure of Cities Program; Advisor: Professor Gary Wray McDonogh; Published December 14, 2010; Printed in the Spring 2011 Bi-College Law Review; All rights reserved.

Abstract

As more services and business migrates to the Internet, individuals who lack the ability to effectively and efficiently use computers and the Internet are at an increasingly greater risk for missing out on new opportunities that are available only to those who are online. Historical models for remediating those who are digitally excluded have made progress towards digital inclusion but much work remains. This paper makes recommendations on how best to advance digital literacy and digital inclusion in America going forward.

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“More than one out of three Americans will not receive all of the benefits that broadband has to deliver – and I’m talking about benefits in lifestyle, in telemedicine, in education, in jobs. They’re simply going to miss out on an important part of the American Dream.” - Dave McClure, President of the USIA, June 22, 2010 (Kent, Broadband for America: A Roadmap to Broadband Adoption, 22 June, 2010)

Introduction

With the growth of Internet, broadband has redefined the historical paradigm of communications and commerce. While precisely quantifying the cumulative impact of the Internet on the economic, political, and social spheres is virtually impossible, it is evident that not all individuals have equal access -- or access at all -- to such an important tool. As contemporary life becomes increasingly digitized, individuals without access are challenged to fully participate in modern society and enjoy the benefits of this global network. Indeed, over time these individuals may soon constitute a population who are in essence, partially disabled – lacking the ability to completely function in our new digital world. However through the application of innovative digital literacy programs, the Internet can help facilitate increased digital social equity.

Digital social equity is a society's responsibility that all of its citizens are digital literate in the context that digital literacy is a required 21st Century skill and society is responsible for the fair, just, and equitable treatments of its citizens. Digital social equity is an extension of H. George Fredrickson's theory of social equity (that those in public administration are making the mistake that citizen A is the same as citizen B; ignoring social and economic conditions) but applied to digital literacy. Digital social equity ensures that a sufficient commitment of digital literacy resources be distributed to groups that experience discrimination and social inequity so that all members of society are digitally literate and

able to use and access the Internet as an integral component of their lives. (Frederickson, 1990) (Urban Dictionary, 2010)

Background and Terminology

What is Digital Inclusion?

Digital inclusion means the long-term availability of access to the network that is the Internet through a “smart” device which allows for a two-way exchange of information from the end-user to the digital community and is a component of digital social equity. Digital inclusion can be accomplished through a number of ways: through smartphones, tablets, Internet equipped digital media players, computers and other electronic devices. Access through devices other than through a desktop or laptop computer presents supplemental challenges and variables in addition to the challenges associated with computer digital inclusion. These can range from service providers in smartphones to non-standard user-interfaces and browsers. Hence, the vast majority (nearly 91%) of all digital literacy initiatives studied utilize computers with Internet access as the primary digital connectivity tool. The benefit that computers provide over other forms of connectivity is that computers are relatively standard and thereby allow for digital literacy content to be tailored even more to computer-learning. Consequently, the major focus of this study is digital inclusion in terms of access to computers as computers currently provide the most conventionally reliable, standard form of access to the Internet. (Hilding-Hamann, Nielsen, & Pedersen, Supporting Digital Literacy: Public Policies and Stakeholders' Initiatives, Topic Report 1, 2009, p. 23)

Identifying digital inclusion and the areas lacking inclusion are integral to providing all individuals with access to the resources best suited to get them online. However, not all forms of digital inclusion are

equal, because certain population groups require hardware and programming that varies based upon their needs.

For example, in communities where senior citizens comprise a significant amount of the population, standard computers would not suffice in providing these individuals adequate access to the Internet. In such a case, additional aids such as larger screens, trackball mice, and larger, modified graphical user interfaces would be necessities in establishing an equal level of access to the Internet. In other communities, such as those where English is not the primary form of communication, modifications to the hardware and software may be required to allow all individuals to effectively access the Internet in a language familiar to them. This is particularly the case in globalized cities such as Hong Kong, where there are three predominant languages spoken and two writing systems used. Computer and Internet services provided only in one might exclude a significant number of individuals from accessing important health and government information. By providing customized content in a number of different languages, these groups of individuals can be digitally included and access all of the benefits that the Internet provides. (Federal Communications Commission, 2010, p. 129)

Physical and social access alone does not equal digital inclusion. Education about how to use computers and the Internet is integral to becoming a “digital citizen.” Without this training, the users are effectively dropped into a situation that is tantamount to driving an automobile without driver’s education: they will not know the risks, tips, and tricks to stay safe and drive a car efficiently and effectively. Indeed in some countries and regions, for example, the European Union, there are training programs that grant users a “Computer Driver’s License.” Similar to obtaining an automobile’s driver’s license, it ensures new users possess the minimum skills necessary to traverse the information superhighway, while not penalizing more experienced drivers. (ECDL Foundation, 2010)

What is Digital Literacy?

Digital inclusion is only one-half of the issue at hand because computers and the Internet are useless without knowing how to effectively utilize them once connected. Digital literacy is an integral part of digital social equity that means the convergence of two aspects: it is the awareness of value of digital inclusion and the ability to effectively use computers and the Internet. This ability to use computers and the Internet requires mastery of a set of core competencies that enable the user to effectively evaluate the resources of the Internet and computers and to discern the quality of data, because the United States' Internet is generally unfiltered and editable by anyone. Digital literacy has become a core competency for almost all professions as well as being an integral part of being a global citizen. Those individuals who are digitally illiterate face increasingly insurmountable obstacles in conducting business, gathering research, or even communicating on a day-to-day business. Similar to providing supplemental resources for special-needs groups in terms of digital inclusion, additional focus and due diligence is necessary for ensuring that individuals who speak foreign languages, individuals who have disabilities, individuals who are uneducated, and individuals who are technology-adverse realize the value proposition that computers and the Internet can offer them. Digital inclusion in combination with digital literacy can create citizen empowerment that mitigates social unevenness and imbalance, facilitating digital social equity.

The implications of digital literacy are enormous: the value proposition of broadband-enabled education, including economic development, improved healthcare, adoption of 21st Century skills, and enhanced public safety are too significant to ignore. Digital literacy is crucial for individuals to begin to understand the value proposition that computers and the Internet can provide them. Far too often, computers have been donated to create computer labs in communities where the need is the greatest without the accompanying education and training of how to effectively use and maintain them. The

value of these computers is severely diminished because they cannot be utilized to their full potential. Consequently, with every installation of computers or technology hardware, it is essential that the providers establish education programs that teach individuals how to use the computers and Internet in a safe and effective way. When a more digitally literate society evolves, the potential for a knowledge-based economy, a more informed public and a more involved citizenry becomes reality. For many, particularly those who are disabled or elderly, digital literacy can result in a significant increase in social inclusion and social equity. Digital literacy today is essential for today's and tomorrow's opportunities and citizenship. (Federal Communications Commission, 2010, p. 5)

What is Broadband and how does it impact Digital Literacy and Digital

Inclusion?

Today, the resources on the Internet are increasingly bandwidth intensive and this is a trend that will only continue in the future. Older dial-up speeds that use telephone-based modems no longer have the capacity to support all of the media and content available on the Internet. Even when services, such as e-health online initiatives become increasingly available, a major impediment in integrating these resources into the communities that need them the most is connectivity. Experts have agreed that future connectivity must be through broadband. (Broadband Commission, 2010, pp. 12-13)

The Federal Communications Commission defines broadband as "high-speed Internet access that is always on and faster than traditional dial-up access... providing higher-speed[s] of data transmission... and access to the highest quality of Internet services. While there is debate amongst engineers and policymakers about what data speeds constitute "broadband," what is clearly evident is that broadband plays a critical role in digital literacy and digital inclusion and that it must be robust, accessible, and affordable. (Federal Communications Commission, 2010)

Broadband and computer access are crucial and public opinion is beginning to reflect the realized importance of this tool. In a global poll conducted by the BBC World Service, four out of five individuals surveyed considered Internet access a fundamental right. 78% said they feel it has brought them greater freedom, 90% say it is a good place to learn new things, and 51% say that they enjoy spending spare time on social networking sites connecting with friends and family. (British Broadcasting Corporation, 2010, pp. 1-2, 6) (Albanesius, 2010)

Crossing the digital divide is also a national challenge. The Internet was developed in the United States and first implemented within its borders. Americans feel that the Internet has given users greater freedom (85% compared to 78% worldwide) and that it is a resource that must be effectively allocated and protected. Some proactive national governments have gone so far as to make broadband a “legal right;” earlier this year, Finland proclaimed that every Finn should have the right to access a broadband connection. (British Broadcasting Corporation, 2010, p. 6) (BBC News, 2010)

A number of individuals agree that the ultimate end-goal of digital literacy and digital inclusion efforts is the creation of an information society, which is described as a society that “makes extensive use of information networks and information technology, produces large quantities of information and communication products, and services and has an industrial structure with diversified contents.” Only through the rolling out of broadband infrastructure and digital literacy will we make progress towards this ideal by achieving digital social equity on the way. (Census and Statistics Department of Hong Kong Special Administrative Region, 2009, p. Forward)

How to Get People Online: the Six Most Important Next Steps to Increase Digital Literacy and Digital Inclusion in the United States

It is important that we expedite enacting the Adoption and Utilization recommendations established in the Federal Communications Commission's National Broadband Plan. The 360-page National Broadband Plan document contains approximately 200 policy proposals for the FCC, Congress, and other agencies to implement over the next decade. Chapter 9, Adoption and Utilization, is an integral component of the plan and while all of the policy proposals must be promptly and simultaneously addressed for the adoption and utilization issues to be enacted, this recommendation focuses solely on Chapter 9 of the National Broadband Plan. (Federal Communications Commission, 2010, pp. 165-190)

1. Create a Special Advisor to the President (Effectively, a National Broadband Czar)

The National Broadband Plan requires a champion that can help coordinate execution between the FCC, Congress, and the other agencies. Currently, the National Broadband Plan has no single leader to help coordinate and negotiate the plan through the normal partisanship that is part of the American political system and reflective of the conflicting priorities and objectives of the wide range of industries, companies, and special interests groups that this undertaking affects. When urgent and bold national initiatives are undertaken that require focus and coordination between Congress and various agencies, the President has often appointed special advisors so that a single entity, focus, and priority can be assigned. Beginning in 1933, President Franklin Roosevelt appointed 11 "czars," or individuals, some not requiring Congressional approval, to take leadership over an initiative. Subsequently, every American President has appointed "czars." President Bush had 32 individuals with "czar" titles and since 1939, President Obama has appointed 39. If there is an initiative that requires coordination and is of important national consequence, Presidents have used "czars" to provide programs an important focus during the last 75 years. It is recommended that a special advisor to the President be created to

facilitate the legislative and execution process. (FactCheck.org, 2010) (Federal Communications Commission, 2010, pp. 165-190)

2. A Digital Inclusion Cost/Benefit Analysis Should be Conducted to Maximize Taxpayer ROI

Broadband adoption is naturally increasing, but the Government Accountability Office or a similar nonpartisan government entity should conduct a cost/benefit projection to estimate a taxpayer return on investment for all components of the proposal.

America's current deficit is unsustainable, according to current Treasury Secretary Timothy F. Geithner, but taxpayer investments in broadband may be able to be made that will ultimately reduce the deficit. As an example, the electronic filing of personal income taxes was enacted to increase government efficiency and reduce government processing costs. Digital inclusion and digital literacy initiatives that cost effectively maximize the numbers of individuals that enjoy the benefits of broadband while will increase national security and competitiveness in the global economy. Software companies, such as SAP, provide ROI applications that analyze public programs. The President, Congress, and the American public are becoming increasingly concerned about the long-term effect of our current and projected Federal fiscal deficit. However, some government expenditures have been analyzed and generally accepted as prudent investments of government tax monies, such as the NASA program. While it may be difficult to precisely quantify every aspect of broadband adoption, this type of analysis and vetting will help provide bipartisan support, public support, and be fiscally healthy for the country. (NASA, 2010) (Zumbrun, 2010) (SAP, 2010)

3. The FCC should continue its public outreach strategy

The FCC should continue its strategy of public outreach used to formulate the National Broadband Plan by engaging the public in its execution through the establishment of a broadband adoption and use working and/or advisory groups.

To date, the FCC's implementation of the National Broadband Plan has effectively engaged the public via continuing their use of Requests for Information (RFI). While this was one of the important components of engaging the public and obtaining their feedback to help vet the strategies and tactics of the National Broadband Plan's formation, increased ongoing substantive support representing the diverse public interests are necessary now that most of the authors of the National Broadband Plan have completed their engagement, left the FCC, and returned to the private sector. Since many of the architects of the National Broadband Plan represented a broad coalition of subject matter experts, the FCC has fewer resources available on staff now that the important execution phase of all recommendations has commenced, including those that focus on broadband adoption and use. There is a well-established precedence of engaging subject matter experts to serve on advisory committees with the purpose of providing input to public officials, including an Internet Policy Working Group that was established by former FCC Chairman Powell, the FCC/NARUC/NASUCA Working Group on Lifeline and Link-Up and the Universal Service Working Group established by current FCC Chairman Genachowski. In fact, Recommendation 9.8 in the National Broadband Plan's Adoption and Use chapter recommends a Broadband Accessibility Working Group to maximize broadband adoption by people with disabilities. These working groups should be expanded, as may be reasonable. Recommendation 9.9 proposes an Accessibility and Information Forum. While forums are useful to the extent that they expand the public dialogue, increase the public's knowledge of the plan, and provide additional input to the FCC and others working to execute the National Broadband Plan, they provide snapshots of information and lack the continuity of a working group. It is recommended that the working adoption and use working groups be project based and terminate once the task is completed, but one or more broadband adoption and use standing working group be established to provide input on a more macro, high level basis, and continuing basis. (Federal Communications Commission, 2005) (Federal Communications

Commission, 2006) (Engebretson, 2010) (Federal Communications Commission, 2010) (Federal Communications Commission, 2010, pp. 165-190)

4. Review of International Digital Literacy and Digital Inclusion Programs and International Broadband Plans

Chapter 9, the National Broadband Plan's Adoption and Use section, contained 165 endnotes. Only one endnote, submitted by Net Literacy, a digital literacy and digital inclusion NGO, referenced the broadband adoption and use works performed by an organization outside of the United States (see Endnote 80 that referenced the European Union's Commission on Digital Inclusion). Subsequent to Net Literacy's filing and the release of the National Broadband Plan, Net Literacy has visited Hong Kong and South Africa and has met with subject matter experts from Australia, the United Kingdom, South Africa, and India to discuss digital inclusion and broadband adoption. Net Literacy has also reviewed other national broadband plans and reviewed in detail, the broadband and adoption surveys and good practices in Hong Kong. Some of these good practices are applicable to or can be modified to meet America's broadband adoption and digital inclusion requirements, in Net Literacy's opinion. To help facilitate the inclusion of international best practices by America and for the international community, Net Literacy launched a Digital Literacy "best practices" beta website. The website was endorsed by International Internet Industry Alliance (IIIA), which also includes the Internet Industry Association of Singapore, the African Internet Industry Association (AfrISPA), and the European Internet Service Providers Association (EuroISPA). Net Literacy was invited to join the IIIA as the first member whose organization focus was on digital inclusion and digital literacy. While the beta version of the site is at www.digitalliteracy.org, a production version with enhanced functionality and look and feel will be launched shortly. Consequently, all nations can learn about digital literacy and digital inclusion by reviewing the good practices of other programs. (Federal Communications Commission, 2010, pp. 165-

190) (Net Literacy, 2010) (Hilding-Hamann, Nielsen, & Pedersen, Supporting Digital Literacy: Public Policies and Stakeholders' Initiatives, Topic Report 2, 2009) (International Internet Industry Alliance, 2010) (Internet Industry Association of Singapore (IIAS), 2010) (AfrISPA, 2010) (EuroISPA, 2010) (Net Literacy, 2010)

5. The Recommendations should be prioritized, have an ROI, and a completion timetable

The recommendations in the Adoption and Use Chapter should be prioritized, costs and benefits projected and quantified with an ROI, and a timetable established for their review and execution that incorporates the other components of the National Broadband Plan. This recommendation is contingent upon and incorporates components of 1. Create a Special Advisor to the President (Effectively, a National Broadband Czar), 2. A Digital Inclusion Cost/Benefit Analysis Should be Conducted to Maximize Taxpayer ROI, 3. The FCC should continue its public outreach strategy, and 4. Review of International Digital Literacy and Digital Inclusion Programs and International Broadband Plans, and while this recommendation is limited to the Adoption and Use chapter, a similar organization may be appropriate to help prioritize and execute recommendations in other chapters. Most significantly, a project management plan (e.g., Program Evaluation Review Techniques (PERT), the Critical Path Method (CPM), or another project management planning tool) should be used to determine the critical path items that should be considered when implementing and executing the plan. Costs of implementing the entire National Broadband Plan range from \$20 billion to \$350 billion – and the enormous spread of these estimates together with the magnitude of costs require the quantification of costs and prioritization of components of the plan as recommended in this section. Unless quantitative analysis is completed, America will continue to spend money on a project without an understanding of its total cost and unable to estimate a ROI on taxpayer dollar investments. (Federal Communications Commission, 2010, pp. 165-190) (Paul, 2010) (Wuorio, 2010)

Compounding the challenge of estimating the costs of merely extending broadband to those households without service are additional complex technology and broadband capacity impactful questions. A study conducted by the State of Wyoming indicated that the per customer mean upfront capital costs to serve the average household ranged on a terrestrial basis ranged from a high of \$18,932 (cable) to \$4,570 (telco) to \$1,324 (fixed wireless). However, some technologies, such as fixed wireless, have more significant bandwidth constraints and the price projections cited do not include upgrading wireless to meet the FCC minimum bandwidth standards stated in the National Broadband Plan (a goal of implementing 100 Megabits per second broadband connections in 100 million American households by 2020 – or the “100 Squared Initiative”). (Federal Communications Commission, 2010, pp. 165-190) (Paul, 2010) (CostQuest Associates, 2006)

6. Funding Broadband Adoption and Use as a component of the National Broadband Plan.

Once the aforementioned five recommendations have been addressed or are being implemented, the issue of funding sources, cost of implementation, and prioritization of implementation should be addressed. Digital inclusion is a national problem and the National Broadband Plan was written to address broadband adoption and use from a national perspective and basis. From a funding perspective, incremental programs that address the national digital literacy challenge must be funded on a national basis since generally, nonprofits, businesses, local government, and state government does not have the incremental resources necessary to effectively address this issue in a consistent manner across the country. The American Recovery and Reinvestment Act has already set aside \$7.2 billion for nationwide broadband deployment, and current estimates put the total cost of the FCC's nationwide broadband plan between \$20 and \$350 billion -- an enormous spread. (Paul, 2010)

While there are hundreds of nonprofits and other organizations whose mission includes increasing digital inclusion and digital literacy, most are local and community based organizations. Thousands of

other nonprofits have missions that are more effectively accomplished when their members are digitally literate, but many nonprofits do not have the resources or the capacity to accept additional projects. Most business' interest in digital inclusion is indirect: a digitally literate workforce is often required to provide a competitive product, but the hiring process often ensures only qualified applicants are accepted. Some businesses have an excellent track record giving back to the communities they serve, but increasing digital inclusion and digital literacy are only one of many worthy initiatives where needs significantly exceed requirements. Generally, local and state governments are experiencing increasing fiscal pressures as a result of declining tax revenues. Often times, municipalities most impacted by budgetary shortfalls are where the digital divide is the greatest and as a result have limited resources to address these issues. Consequently, the funding to execute the adoption and use recommendations must come from the Federal Government. Funding resources are required at the national, state, and local levels. (Gopal, 2009) (National Public Radio, 2000) (Federal Communications Commission, 2010, pp. 165-190) (McClure, 2009) (Kent & McClure, Digital Inclusion: Bringing the Rest of America Online With Broadband, 2009) (Paul, 2010)

(a) National Funding With National Implementation.

Since increasing adoption, use, digital inclusion, and digital literacy are national problems, some issues can most effectively be addressed on a national basis, despite the budgetary and fiscal constraints being experienced at the national level. Increasing awareness of broadband's value proposition should be approached from both a national "top down" (as well as a local "bottom up") campaign, as discussed in Net Literacy's Request for Information filing. (Government Accountability Office, 2010) (Kent, Reply Comments of Net Literacy Corporation, 2009)

As an example, targeted media information or PSAs can reinforce the value proposition of broadband and overcome the objections to broadband by populations groups with low broadband penetration. A

Net Literacy Safe Connects program hosted on the Indianapolis Public School's website in December 2010 has received significant state acclaim. Comcast Cable and Bright House Networks, Indiana's two largest cable operators, have agreed to carry the 30 minute Internet safety video on their "local on demand" service on cable systems throughout Indiana. In accordance with Indiana General Assembly House Resolution 095 which encourages Public, Education, and Government (PEG) Channels to carry Safe Connects programming, these cable operators that serve over 80% of Indiana's cable customers will coordinate carriage of this programming on the PEG Channels in their franchise footprint. Internet safety is the primary reason that 12% of Americans do not subscribe to broadband. Through mass media programs such as this but on a national basis, adoption objections can be overcome and the Internet can become a safer place for existing broadband customers. Net Literacy and Indiana is the only state where such an initiative exists, and an Internet safety awareness campaign would be most effectively coordinated throughout the country on a national rather than a state or local basis. (Indiana General Assembly, 2009) (IPS Tube, 2010) (Net Literacy, 2010)

Examples of other programs that increase broadband adoption and use require national implementation and coordination include the recommended national digital literacy website or defining the universal broadband service offering, recommend in the Plan. The national digital literacy site will have national, state, and local contributors, but it will be most efficient a single national single source best practices website is maintained. (Federal Communications Commission, 2010, pp. 165-190)

Another example is the universal broadband service recommend in the National Broadband Plan. When determining the pricing of the service, qualifications necessary to receive the service, and establishing other criteria, those individuals in population groups with low broadband adoption groups should be treated fairly, consistently, and on a basis that consider adoption and use as a national rather than state or local challenge. (Federal Communications Commission, 2010, pp. 165-190)

(b) National Funding With State Implementation.

\$7.2 billion of the \$787 billion in the economic stimulus package was allocated to broadband, which included adoption programs but primarily focused on middle mile, plant, and wireless infrastructure construction. As an example, the Broadband Technology Opportunity Program (BTOP) awarded money on a national basis, the programs were vetted and prioritized by committees established in each state as part of the national vetting and prioritization process. Since states have a more detailed and may have a different perspective of their needs compared to the federal government, they were included as a component of the qualification and prioritization process. States can most effectively help allocate resources to communities since their perspective is more local and more detailed when compared to the federal government. While some states may prefer to have more control over the funding allocated in their state, it is my recommendation that states' primary responsibility be to help coordinate and manage digital inclusion and digital literacy efforts within the state in accordance with the National Broadband Plan and based upon the priorities resulting from execution of the suggestions in the above, 5. The Recommendations should be prioritized, have an ROI, and a completion timetable. States should also be responsible for overseeing the effective execution of the local implementations. Most states do not have the financial strength to assume additional funding mandates, so it is recommended that Federal dollars be used for implementation and states be allowed to contribute additional monies if their situation permits. (Amadeo, 2010) (National Telecommunications and Information Administration, 2010) (Paul, 2010) (McNichol, Oliff, & Johnson, 2010)

(c) National Funding With Local Implementation.

Net Literacy has argued that digital inclusion and digital literacy can be most effectively executed on a local and street-by-street basis in its filings with the FCC. The three most resource intensive

components of digital literacy are purchasing computer hardware, paying reoccurring broadband connectivity service fees and providing digital inclusion and digital literacy training. One challenge is that publically available cost estimates do not exist. Consequently and for the purpose of this thesis, assumptions were made and costs were estimated to create the basis of a local cost hypothesis necessary to increase digital inclusion and digital literacy at the local level regarding hardware, training, and broadband costs.¹ (Kent & McClure, Digital Inclusion: Bringing the Rest of America Online With Broadband, 2009) (Kent, Reply Comments of Net Literacy Corporation, 2009)

Estimating Costs

While the National Broadband Plan's implementation cost has been estimated, costs estimate to execute the digital inclusion and digital literacy component has either not been calculated or the information has not been made publically available. Cost is an important component of assessing the ROI of the National Broadband Plan, and with limited information, I believe it to be a useful exercise to gain an appreciation of the order of magnitude of the digital inclusions component. Until completing this estimate, I did not know if it would cost \$1 billion or \$10 billion to complete this component. It should be noted that in deriving this cost estimate, I used the digital literacy corps model proposed in the National Broadband Plan and the cost estimates are designed only to provide the readers a sense of what the cost could be based upon two sets of assumptions. The four sections below are (i) assumptions used to estimate the financial order of magnitude using two digital inclusion scenarios, (ii)

¹ Please note that these are estimates based upon Net Literacy experience and the use of data and analysis that are footnoted. Testing the assumptions is outside the scope of this thesis, but this exercise was necessary to gain an appreciation of the order of magnitude of digital literacy and digital inclusion costs.

purchasing computer hardware, (iii) paying reoccurring broadband connectivity service fees and (iv) providing digital inclusion and digital literacy training. (Federal Communications Commission, 2010, pp. 165-190)

A December 2008 Nielsen study estimated that 19.4% of American households did not have a computer at home. A 2009 Child Trends Data Bank study found that 90% of all children have computers at home.² No technology product will receive 100% penetration, just as Pew research approximates that 2% of all American households do not have any form of fixed or wireless telephone service in their home (2.3 million households and as of 2010). As previously discussed in this paper, 10% of all American households do not subscribe to a multichannel video provider (11.5 million households). (Nielsen Company, 2008) (Pew Research Center for the People & the Press, 2010) (Child Trends Databank, 2010)

(I) Assumptions Used to Estimate the Financial Order of Magnitude Using Two Digital Inclusion Scenarios

For the purposes of estimating the number of individuals requiring digital literacy training and the associated costs, it was assumed that 18% of all 115 million American households do not have a computer at home in 2010, 5%³ of all households would not be interested in a home computer under

² Note: this has not been Net Literacy's experience working with the Indianapolis Public School system (87% on free or reduced lunch programs) and where surveys at five elementary schools indicate that 32% of families have a working computer at home – consequently, local variations in demand may be significant.

³ Research is required to project the requirements and an estimate and assumptions were used since no publically available data exists. The 5% estimate used to quantify computer costs was derived analyzing information regarding the 2% and 10% of households that do not subscribe to telephone or a multichannel service provider,

any circumstances, and 21% of the 13% of households do not subscribe to broadband because of costs, then approximately 3,139,000 households would require computers if, hypothetically, the National Broadband Plan were executed so that this group would receive computer hardware to overcome their cost objection. Please note the inaccuracies inherent in this overly simplistic analysis, and the purpose of the calculation is to merely estimate an order of magnitude for the cost implementing of this component of the National Broadband Plan. (U.S. Census Bureau, 1996)

(II) Assumptions Used to Estimate the Purchasing of Computer Hardware

Estimating that the average cost of a computer would be \$250⁴ (a personal computer with 2 gigabytes of RAM and a 250 gigabytes of storage, an office and antivirus application and an extended four year hardware warranty and a four year call center support contract) reflecting a reduced cost because of efficiencies likely in the bulk purchase of this magnitude of computers, it would cost \$785 million to purchase a computer for 3,139,000 households. This excludes costs required by special accommodations and hardware required for some population groups, such as the blind or those that are unable to use a keyboard. Computers are typically amortized over a three to four year period and for purposes of calculating a reoccurring cost, the net present value of future computer costs should be included in the calculation, but this is beyond the scope of this simple cost estimate.

respectively. 19.6% of households did not have a computer in 2008 and it is estimated that this number is 18% in 2010. (Pew Research Center for the People & the Press, 2010)

⁴ The \$250 estimate is based upon discussions with the Indianapolis Public Schools that purchased 12,000 computers for their students in a competitive bidding process, and then further discounted because of the increased order of magnitude of this computer order. Information was provided to Net Literacy in confidence.

At \$25 per month for a limited universal service, the 3,139,000 households would require \$942 million in funding per year to pay for a form of universal broadband service. While it is expected that some of these reimbursements would be reduced or phased out over time, the \$942 million is the funding that would be required to provide a limited universal broadband service for purposes of this scoping cost estimate. It was assumed that installation and any required consumer premise equipment would be donated by the broadband provider in consideration for these incremental customers being charged on a bulk billing. While the actual monthly subscription cost would gradually decrease as non-adopters were trained to be digitally literate and were converted to paying all or a portion of their broadband costs, for purposes of establishing a running data point, the full cost was assumed in the estimate below.

The \$25 monthly cost of broadband was estimated as follows: it is difficult to determine the government's cost of providing broadband service to 3,139,000 households since existing costs are impacted by technology, the amount of competition in a market area, discounts associated with packaging or bundling with other products offered by the provider, and sales promotions. Also, I expected that broadband costs will increase as broadband providers significantly increase the bandwidth provided to consumers to comply with the standards described in the National Broadband Plan. The actual cost of providing broadband to 3,139,000 users in 50 states using a variety of technologies will be calculated once an RFP process is completed. Also, the accounts on these universal service customers may be flagged to ensure that they receive a defined and enhanced level of customer service. Consequently, the \$25 per month is my best reasonable estimate given the many variables that have not yet been finalized. (Federal Communications Commission, 2010)

(III) Assumptions Used to Estimate the Reoccurring Broadband Connectivity Service Fees

The most difficult cost to estimate is the cost of teaching these population groups computer, Internet, and Internet safety skills, together with identifying their own personal value proposition so that they are

not only digitally included, they are digitally literate. Costs range significantly depending upon assumptions. In Net Literacy's model, a Digital Literacy Corps of student volunteers provide the service at no cost and as a community service. The National Broadband Plan cites Net Literacy's Digital Literacy Corps as an example, but it leaves open if the program would be based on another model such as AmeriCorps or another public service model. Also, there are other models that should be considered and may be more appropriate for working with selected population groups with low broadband penetration. (Federal Communications Commission, 2010, pp. 165-190) (Kent & McClure, Digital Inclusion: Bringing the Rest of America Online With Broadband, 2009)

At the low cost end of the spectrum is an enhanced version of the Net Literacy model. It would be comprised of a national Digital Literacy Corps that utilizes the 30 million high school and college students (many of which have school district mandated community service requirements). Some funding would be required to teach and recognize nonprofit adult volunteers that helped coordinate the program, and it is contemplated that there would be a level of paid administrators so that the program is effectively coordinated on a national basis and within local communities. Net Literacy's existing model partners with local nonprofits that have members that are included in population groups with low broadband penetration and is all volunteer, but this may not be quickly scalable on a national basis. (Net Literacy, 2010)

While 3,139,000 households require a computer and broadband and the average home has 2.53 occupants, determining who requires digital literacy training is far more complex and nuanced than a simple mathematical equation. As an example, some individuals in homes that have a computer and broadband access are not digital literate. Other individuals in households without a computer and broadband at home are digitally literate and use computers at libraries, work, or the homes or friends or family to access the Internet. Also, every year, the number of individuals that are digitally literate

continue to increase, even without a national coordinated digital literacy initiative. Part of the increase in broadband penetration is a result of senior citizens passing due to old age (a population group with low broadband adoption) and being replaced by digital natives (that are a population group with high broadband adoption rates). Net Literacy has proposed in its second FCC filing that additional research is required to better understand and effectively target the digitally excluded. But the digital literacy corps program will accelerate digital inclusion conversion and also help increase the skills of those that are only partly digitally literate. Net Literacy believes that there is an opportunity cost for individuals that are not digitally literate – and consequently, facilitating digital inclusion is a necessary and important national initiative. The major advantage of a concerted effort to increase digital inclusion and digital literacy is that this initiative will increase the speed of conversions to digital literate and digitally included individuals (Kent, Reply Comments of Net Literacy Corporation, 2009) (Net Literacy Alliance, 2010) (Kent & McClure, Digital Inclusion: Bringing the Rest of America Online With Broadband, 2009)

Net Literacy has also identified a social component to creating a broadband value proposition, and as more individuals come online, social pressure is increased for non-adopters to become digitally literate. This also will serve as a catalyst to naturally increase broadband adoption. (Kent & McClure, Digital Inclusion: Bringing the Rest of America Online With Broadband, 2009) (Kent, Reply Comments of Net Literacy Corporation, 2009)

Also, some individuals in population groups with low broadband penetration will need additional accommodations, such as the illiterate, the disabled, or even those that speak English as a Second Language (ENL) and will require additional assistance to understand how digital inclusion can empower them in the context of American society. (Kent, Reply Comments of Net Literacy Corporation, 2009)

(IV) Assumptions Used to Estimate the Costs of Providing Digital Inclusion and Digital Literacy

Training

For purposes of this exercise of scoping potential costs of local digital inclusion and digital literacy efforts, I assumed that 8 million Americans require either computer or computer and Internet training and the objective is to train 8 million Americans in four years (or 2 million per year). The 8 million estimated was derived by assuming that one person in the 3,139,000 households would require training (3.1 million), one person in 3% of America's remaining 112 million households would require training (3.4 million), and approximately 25% of the households that do not have access to broadband will require training once broadband becomes available (1.5 million). The National Broadband Plan estimates that approximately 4% of America's households do not have access to broadband (5.7 million households). (Federal Communications Commission, 2010, pp. 165-190)

Digital Inclusion Program Scenarios:

Scenario One

An enhanced Net Literacy digital literacy corps student volunteer model working through existing nonprofits and schools coordinate by teachers and a paid staff.

- Team – 250,000 high school and college student volunteers receiving an average of \$100 in pizza and \$100 gift cards = \$50 million/year
- Leadership – 8,333 teacher or nonprofit “volunteers” receiving an average of \$1000 in expenses, gift cards, and recognition = \$8.3 million/year
- Leadership paid 1,000 individuals earning \$40,000 per year = \$40 million/year
- Number of individuals trained per student volunteer: 8 digitally excluded individuals trained per student team member per year (excludes leadership)

- Total costs are \$98 million/year or \$49/person trained (note: excludes supplies, transportation, training materials, and other expenses), and an estimate for these is included in the calculations below.

Scenario Two

A Digital Literacy Corps compensated of a size similar to AmeriCorps and compensated on the same basis as AmeriCorps employees working through existing nonprofits and schools coordinated by a paid staff.

- Team - 43,000 individuals earning \$15,000 per year (salary and education award) = \$645 million/year
- Leadership – 4,000 individuals earning \$40,000 per year = \$160 million/year
- Number of individuals trained per team member: 46 digitally excluded individuals trained per team member per year (excludes leadership)
- Total costs are \$805 million/year or \$402 in costs per person trained
- Cost per individual trained = \$402/person trained (note: excludes supplies, transportation, training materials, and other expenses) and an estimate for these is included in the calculations below.
(Northern Arizona University, 2010)

Digital Inclusion and Digital Literacy Costs for Training 8 Million Americans:

- \$784 million – computer hardware costs (\$196 million per year) assuming no net present value for future computer hardware costs or the incremental costs necessary for those individuals with disabilities.

- \$942 million – universal broadband service costs on an annual basis once all targeted households are online (cost estimates below project 25% in year one, 50% in year two, 75% in year three, and 100% in year four of the annual \$942 million to be incurred).
- \$98 million to \$805 million per year for training costs, limiting the cost estimates to the two digital literacy corps cost scenarios.
- \$200 million in training materials, transportation costs, and other associated costs per year since insufficient information exists to accurately calculate the expenses
- Based upon these assumptions, the four year costs to provide equipment, broadband, and digital literacy training range from \$4.3 billion to \$7.1 billion (or from \$538 to \$888 per American trained and broadband enabled).

It should be noted that Net Literacy's digital literacy corps model contemplates utilizing computer labs in schools and public labs in nonprofits. At Net Literacy, costs to build or expand computer labs at schools, community centers, churches, and other nonprofits have been modest. Since Net Literacy receives its computers as donations and enjoys licensing discounts from Microsoft, using student volunteers, Net Literacy has provided approximately 11,000 computers within the central Indiana area during the last three years at an average cost of \$12.60. This includes transportation, refurbishing, warehouse, facility, licensing, and pizza costs. (Net Literacy, 2010)

In early 2010, Honorary Board Member Lt. Governor Becky Skillman asked Net Literacy to begin a program that focused computer donations in more rural areas of the state. The program commenced in March and working with the Indiana Association of United Ways, 525 computers have been donated to 17 United Ways serving 18 counties and providing computers to build or expand computer labs in 95 agencies. An additional 145 computers are ready for a January 2011 delivery that will provide computers to two additional United Ways serving five Indiana counties. Because Net Literacy uses a

Department of Transportation approved moving company to deliver the computers and conducts additional quality assurance programs on these computers, costs are higher and average approximately \$27.00 per delivered computer. In 2010, the 95 United Way agencies served over 28,000 Hoosiers, and consequently, the costs to equip nonprofits is relatively modest. It has been Net Literacy's experience that nonprofits that do not have a computer lab are willing to purchase the wireless local area networking equipment and broadband to receive the donated equipment, with no only one agency (a preschool) rejecting the broadband connection requirement, which Net Literacy waived. Consequently, partnering with nonprofits is inexpensive and since it supports the nonprofits' missions, they are an efficient and effective training location to help teach digital literacy. (Net Literacy Alliance, 2010) (Net Literacy, 2010)

In conclusion, if non adopters that are digitally illiterate and digitally excluded can receive training, a computer, and broadband for less than \$1,000 per person, how much is that worth the digitally literate consumer? From the consumer's perspective, the Internet Innovation Alliance estimated that the average person saves \$7,707 when shopping online (with entertainment, travel, housing, food, and apparel accounting for the majority of the savings). The amount saved by a consumer would depend upon their disposable income and purchasing habits, but an argument can be made that those individuals that shop or use the Internet to search when making purchasing decisions do save some amount of money if they have access to an online service. A consumer's individual ROI may become part of each individual's value proposition, and this calculation may help provide our national leadership with the ROI calculation outlined in 5. The Recommendations should be prioritized, have an ROI, and a completion timetable

(Internet Innovation Alliance, 2010)

Conclusion

“Digital empowerment refers to the ability to use the wealth of resources in computing and the Internet to learn, communicate, innovate, and enhance wealth—to move from being a digital novice to a digital professional or innovator. An effective Digital Inclusion Strategy provides a path to full participation in Digital Society... People also have to understand that the Digital Economy is moving forward and that digital literacy and access is your ticket.” –Karen Archer Perry, Founder and Principal Consultant, Karacomm (Microsoft Corporation, 2007, pp. 3-10)

While much digital inclusion and digital literacy work has been accomplished, much work remains. Millions of individuals on the wrong side of the digital divide are missing out on the richness and promise that access to broadband provides. Digital inclusion and digital literacy leverage technology so that many of the underserved are able to breakout out of a cycle of poverty and gain digital social equity through this process.

Digital Literacy is constantly evolving; such rapid growth is a sign of its success. While the statistics published in this paper might soon be out-of-date; the tried-and-true methods and best practices outlined will continue to serve as models that are proven to be scalable and replicable throughout many communities.

Although digital literacy and digital inclusion programs are expensive, the costs associated with digital exclusion are astronomical. It is a global economic and social equity that the target groups of individuals who need the most digital literacy training receive the resources that will enable them to become digital citizens. With digital literacy skills becoming a requisite condition to employability across an increasing number of occupations, failure to include these individuals will become more than just a disservice to future generations, it will become a crisis. Further, those on the wrong side of the digital divide will be

increasingly excluded from the richness and resources that individuals, businesses, and governments are placing online. Digital inclusion creates digital social equity and digital literacy is the most efficiency way of impacting this social paradigm.

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