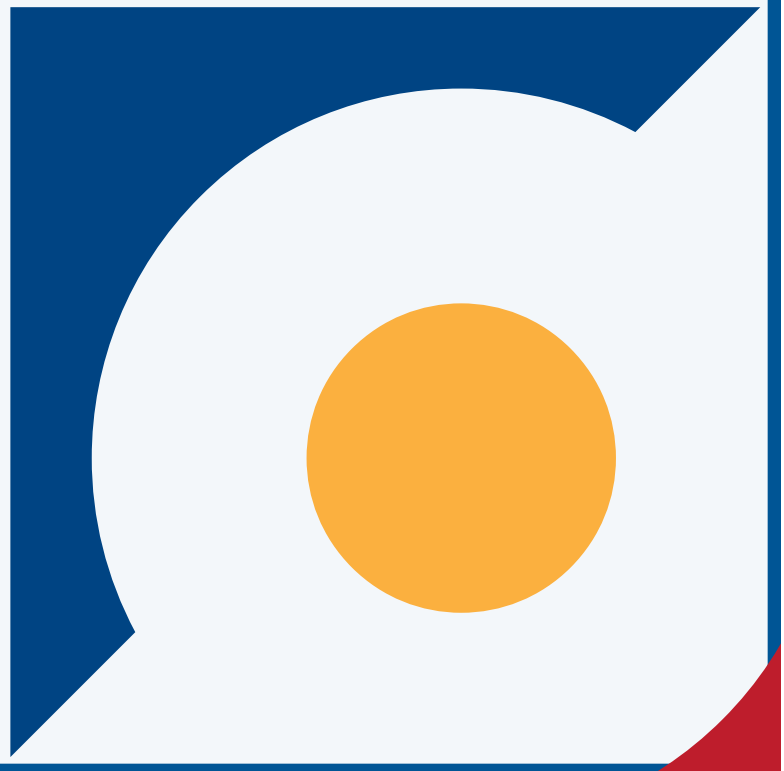




Broadband and Education: Enriching Ohio's Students through Technology

September 2012



By the end of the next decade, 57% of all jobs in Ohio (approximately 3.3 million jobs) will require some education above high school.¹ Currently, though, only 31% of Ohioans 25 years and over have an associate's degree or higher.² A 2012 Brookings Institute report found that advertised job openings in large metropolitan areas across the nation require more education than what most adults have attained.³ Finding methods to narrow the education gap in Ohio will be important to making the state and its residents economically competitive in the next decade.

Technology can be a key component of widening education options, improving educational attainment levels in Ohio, and helping make the state economically competitive. Both nationally and at the state level, the use of technology itself in education has become a priority. The National Education Technology Plan aims to apply the technologies used in our personal and professional lives to the entire education system.⁴ In Ohio, Governor John Kasich has supported the expansion of digital learning by "defining its use and creating standards for blended learning environments."⁵ A recent survey by the Leading Education by Advancing Digital (LEAD) Commission found that approximately 74% of teachers and 82% of parents believe that it is very important for schools to make good use of technology in education. Both parents and teachers believe that technology can improve education by assisting students in becoming more engaged in learning; providing flexible, individualized, and hands-on learning opportunities; and better connecting the classroom to the real world.⁶

Broadband plays a significant role in the incorporation of technology into education. The LEAD Commission's survey discussed above reports that 60% of teachers and 63% of parents believe that high-speed Internet provides students a big advantage in school.⁷ It can facilitate e-Learning and the development of online content for classes. It can also enhance communication between teachers, parents, schools, and students. The National Broadband Plan includes recommendations to improve school and library connectivity, accelerate online learning, and personalize learning and improve decision-making with electronic educational records and financial data transparency.⁸

In its 2011 Residential Technology Assessment, Connect Ohio examined how broadband is enabling Ohioans to be better educated. The results of this analysis show that digital learning is important to helping students achieve their educational goals.

Among the findings from this survey:

- Approximately **2.9 million** Ohio Internet users (40%) go online for educational purposes.
- Rural Ohioans with Internet access are **significantly less likely** to conduct digital learning compared to Internet users living in urban or suburban counties in Ohio.
- Over **one-half (51%)** of minority Internet users in Ohio go online to conduct digital learning, compared to only 39% of their Caucasian counterparts.
- One in ten (**10%, or approximately 237,000**) Ohioans who access the Internet via a cell phone are using these devices for e-Learning.
- Nearly **1.5 million** Ohio children are using the Internet at home for schoolwork. However, nearly one in four households with children do not have broadband in Ohio, meaning that there are over 618,000 children in the state who are not able to access the Internet for their schoolwork at home.
- Parental education impacts children's use of home Internet for schoolwork. Of households with children where the parents themselves go online for e-Learning, **71%** report they have children who are also using the Internet for schoolwork, significantly higher than the 55% of households with children where parents are not e-Learners.

1 Georgetown University, <http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/midwest-challenge.pdf>

2 U.S. Census, Educational Attainment, 2006-2010 American Community Survey 5-Year Estimates, <http://factfinder2.census.gov>.

3 Metropolitan Policy Program at Brookings, *Education, Job Openings, and Unemployment in Metropolitan America*, <http://www.brookings.edu/~media/Research/Files/Papers/2012/8/29%20education%20gap%20rothwell/29%20education%20gap%20rothwell.pdf>

4 U.S. Department of Education, *National Education Technology Plan 2010*, <http://www.ed.gov/technology/netp-2010>

5 *Ohio's 21st Century Education & Workforce Plan*, http://governor.ohio.gov/Portals/0/pdf/MBR/FINAL%20Education%20Workforce_ON-LINE%20VERSION.pdf

6 LEAD Commission, August 2012, *Parents' and Teachers' Attitudes and Opinions On Technology in Education*, <http://www.leadcommission.org/sites/default/files/LEAD%20Poll%20Deck.pdf>

7 Ibid.

8 Federal Communications Commission, *National Broadband Plan*, <http://www.broadband.gov/plan/executive-summary/>

Ohio e-Learners

Broadband has increasingly become a tool that can help Ohioans improve their educational attainment. More and more Ohio students are using the Internet for higher education. According to a report published by the Ohio Board of Regents, between the fall of 2008 and the fall of 2009, enrollment in higher education distance learning courses in the state increased by over 25%, significantly more than the 12% enrollment growth in the entire university system of Ohio during the same time period.⁹ Of those students enrolled in distance learning, 60.5% were community and technical college students, while the remaining students were enrolled at university campuses or regional branch colleges.¹⁰ There are 436 degrees and certificates available to students at a distance in Ohio, the largest percentage of which are associates degrees (36%).¹¹

Connect Ohio research on e-Learners sheds more light on how adults are using the Internet to further their education. Approximately 2.9 million Internet users in Ohio (40%) are using this technology to take online classes or conduct research for schoolwork. Of Ohioans who access the Internet via their cell phones, 237,000 (10%) are using these devices for e-Learning applications. While this represents a large portion of Ohio's population that is using the Internet for education, the percentage of Ohio e-Learners is significantly less than the average for all states surveyed by Connected Nation in 2011 (Figure 1).¹²

While a large number of Ohio Internet users are using e-Learning tools, further research indicates that not every Ohioan is taking advantage of this opportunity at the same rate. Connect Ohio's analysis shows who in the state is using the Internet for educational purposes (Table 1).

Younger Ohioans are more likely to take advantage of the Internet for their educations. Nearly 57% of Ohio Internet users age 18 to 24 go online for education. Use of e-Learning applications drops off sharply after the age of 45 in Ohio, with only 27% of Internet users in that age range using e-Learning applications.

Low-income Ohioans who may have the most to gain by improving their educations and gaining a better foothold in the job market are not fully benefiting from e-Learning opportunities. Only 41% of low-income Ohio Internet users (those with annual household incomes below \$25,000) are going online for school. This equates to over 1.5 million low-income Ohioans who are not using the Internet to expand their educational opportunities. In fact, the use of e-Learning is the highest among Ohio Internet users who make \$75,000 or more. Almost one-half of Internet users in this income bracket (49%) use e-Learning applications, a significantly higher percentage than the state average.

Figure 1.

Percent of Internet Users who Are e-Learners

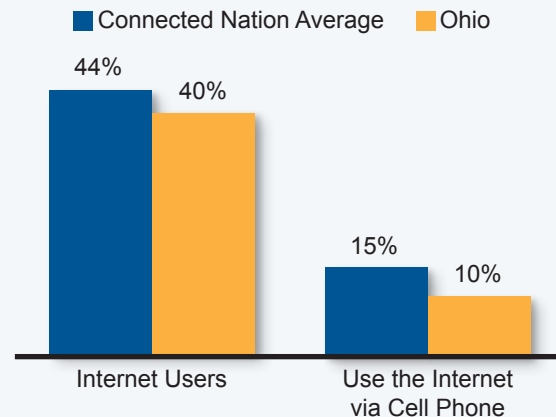


Table 1.

Percent of Ohio Internet Users who Are e-Learners by Demographics

	Internet Users
State Average	40%
Age	
Age 18-24	57%
Age 25-34	50%
Age 35-44	54%
Age 45 and older	27%
Annual Household Income	
Less than \$25,000	41%
\$25,000-\$49,999	42%
\$50,000-\$74,999	40%
\$75,000 or more	49%
Race/Ethnicity	
Caucasian	39%
Minority	51%
Education	
No college education	30%
College education	47%
Gender	
Male	39%
Female	42%

⁹ Ohio Board of Regents, Distance Learning Report, http://www.ohiolearns.org/sites/default/files/oln_pdfs/Distance_Learning_Report.pdf

¹⁰ Ibid.

¹¹ Ibid.

¹² Connected Nation conducted similar surveys in ten states in 2011: Alaska, Florida, Iowa, Michigan, Minnesota, Nevada, Ohio, South Carolina, Tennessee, and Texas, <http://connectohio.org/survey-results/residential>

In Ohio, minority Internet users are significantly more likely to go online for education than Caucasian Internet users. Over one-half of minority Internet users in Ohio (51%) go online for e-Learning, compared to only 39% of their Caucasian counterparts.

Not surprisingly, Ohio Internet users with some college education are significantly more likely to go online for schoolwork. Almost one-half (47%) use the Internet to take online classes or conduct research for school, compared to only 30% of Internet users with no college education. For these Ohio Internet users that are pursuing or have achieved higher education degrees, the Internet is a crucial educational instrument.

Female Ohio Internet users are slightly more likely to go online for e-Learning applications than males. Statewide, 42% of women who use the Internet are going online for educational purposes in the state.

K-12 Education and the Internet

Computers and the Internet are not only tools for adult e-Learners in Ohio; they also provide educational opportunities for Ohio children. In a recent report published by the Evergreen Education Group, Ohio was ranked second in K-12 online school enrollments, with 31,000 students enrolled in a full-time online school.¹³ Across the state of Ohio, there are 27 online, or “e-Community” schools, with 22 serving students in grades K-12. Enrollment has increased in these schools by 15% in a two-year period (between the 2008-2009 and 2010-2011 school years).¹⁴ Additionally, recent state legislation lifted a moratorium on the opening of new K-12 e-Schools in the state and called for, among other provisions, the development of operational standards, an online clearinghouse of digital courses, and the creation of a Digital Learning Task Force that will develop strategies to expand digital learning to help students customize their educations, provide cost savings to the state, and meets the economic needs of Ohio.¹⁵ Three new “blended learning” schools opened in the 2012-2013 school year; these schools will allow students to take classes in both traditional classrooms and online.¹⁶ In 2012, Nordon High School in northeastern Ohio began a program that will allow students to take classes completely online and lend them a laptop computer. The program is available to all Nordon High School students, home school students, and students enrolled in online charter schools throughout the state. It also provides opportunities for traditional students to take online elective courses and access resources to retake classes they have not passed.¹⁷

Many schools across both Ohio and the nation are not only trying to encourage online learning, but also are encouraging increasing the use of technology in the classroom. Bring Your Own Technology/Device (BYOT/D) programs in some school districts have students bringing their own laptops or other computing devices to school for use in class, while the school provides devices to students who do not own them. This is a popular program that helps schools fund increased technology use in the classroom and may provide more individualized instruction opportunities for students. One-to-one computing programs require one computer per teacher and student, which schools can provide or begin a BYOT/D program to facilitate. A one-to-one program has been implemented at Licking Valley High School in Newark, Ohio in the 2012-2013 school year. This program will allow teachers to incorporate videos, document sharing, and blogs in classroom activities.¹⁸ Such programs may help equalize technology and education opportunities for students who do not have Internet access or a computer at home.¹⁹

13 State Impact, “Ohio #2 in Online School Enrollment”, <http://stateimpact.npr.org/ohio/2012/03/23/ohio-2-in-online-school-enrollment/>

14 Evergreen Education Group, *Keeping Pace with K-12 Online Learning*, <http://kpk12.com/cms/wp-content/uploads/KeepingPace2011.pdf>
15 Ibid.

16 State Impact, “Ohio, Now With 28 New Charter Schools”, <http://stateimpact.npr.org/ohio/2012/09/07/ohio-now-with-28-new-charter-schools/>

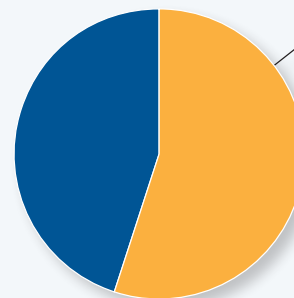
17 The-News-Leader.com, *Schools now offer high school online*, <http://www.the-news-leader.com/news/article/5213399>

18 Newark Advocate, “New program provides netbooks for every Licking Valley High School student”, http://www.newarkadvocate.com/article/20120824/NEWS01/208240303/Program-provides-netbooks-all-Valley-high-schoolers?nclick_check=1

19 U.S. Department of Commerce and National Telecommunications and Information Administration, “Mobile Technology in Schools K-12 Affinity Group Presentation”, August 7, 2012.

Connect Ohio research shows that the Internet plays an important role for children who can access it. Approximately 55% of parents with children in the household report that their children access the Internet at home for schoolwork (Figure 2), on par with the average of 55% among states surveyed by Connected Nation in 2011. This represents nearly 1.5 million children in Ohio who are using the Internet for education at home. However, nearly one in four Ohio households with children do not have broadband, meaning that there are over 618,000 children in the state who are not able to access the Internet for their schoolwork at home.

Figure 2.
Ohio Households with Children



55%
report that their
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schoolwork

In homes where the head of household is 35 or older, children are significantly more likely to use the Internet for schoolwork than households where the head is under 35 (Table 2).

Children’s use of home Internet service for schoolwork does increase with household income level. In only 34% of low-income households, parents report that children use the Internet at home for school, compared to 61% of households with annual incomes greater than \$25,000.

There are no significant differences between minority households and non-minority households in terms of how children use home Internet service for education. Like their parents, many minority children in Ohio are utilizing the Internet for their education.

Parental educational experiences are an indicator of whether children will utilize the Internet for their educations. Approximately 61% of parents with at least some college education have children that use the Internet at home for schoolwork, a significantly higher percentage than the 45% of those with no college education.

Parental e-Learning experiences have an even greater impact. Of households with children where the parents themselves go online at home for e-Learning, 71% report that their children also use the Internet for schoolwork, significantly higher than the 55% of households with children where parents are not e-Learners (Figure 3). Expanding the use of the Internet and technology in K-12 education may be a matter of educating both parents and children.

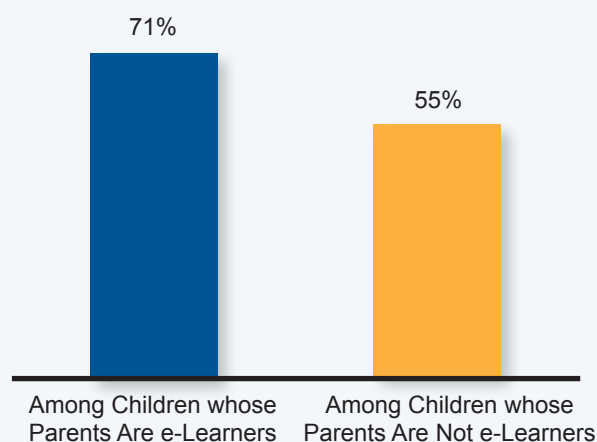
Table 2.

Percent of Households by Demographic whose Children Use Home Internet Service for Schoolwork

	Households with Children
State Average	55%
Age	
Age 18-34	34%
Age 35 and older	71%
Annual Household Income	
Less than \$25,000	34%
\$25,000 or more	61%
Race/Ethnicity	
Caucasian	51%
Minority	56%
Education	
No college education	45%
College education	61%

Figure 3.

Percentage of Households with Children that Use Home Internet Service for Schoolwork



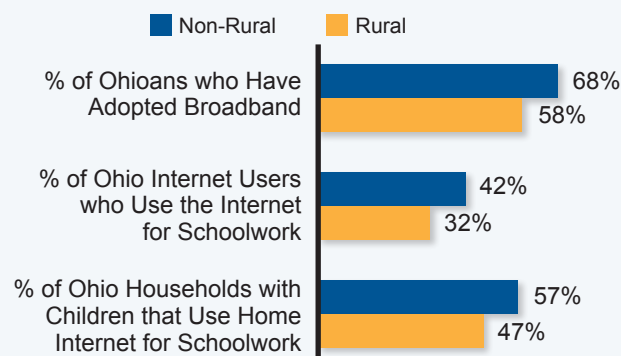
Education and Technology Use in Rural Ohio

Rural communities are often only served by one broadband provider and have slower Internet connections than non-rural communities.^{20,21} This truism is reflected in Ohio, where almost 11% of rural residents cannot access home broadband service that is capable of streaming classroom lectures in standard-definition video, compared to only 0.1% of residents in non-rural areas.²² About 9% of rural residents across the United States cite availability as the main reason they do not have high-speed Internet, in contrast to only 1% of urban residents.²³

In Ohio, this digital divide has had an impact on the adoption and use of technology for educational purposes in rural portions of the state. Only 58% of rural Ohioans have adopted broadband at home, compared to 68% of urban and suburban Ohioans (Figure 4). Additionally, only 32% of rural Ohio Internet users go online for education, a significantly lower percentage than the 42% of Ohio Internet users who go online for education in urban and suburban parts of the state. This means that almost 1.3 million Ohioans in rural areas are missing out on the educational opportunities that Internet can provide. Rural Ohio households with children are also less likely to report that their children use home Internet service for schoolwork than those in non-rural parts of the state, again indicating that rural areas may have much to gain from increased broadband access and online education application use.

Figure 4.

Rural Ohio Use of Technology for Education



²⁰ ICF International, "Broadband and Rural Education: An Examination of the Challenges, Opportunities, and Support Structures that Impact Broadband and Rural Education", http://icfi.academia.edu/CaitlinHowley/Papers/1790013/Broadband_and_Rural_Education_An_Examination_of_the_Challenges_Opportunities_and_Support_Structures_that_Impact_Broadband_and_Rural_Education

²¹ Approximately 16% of rural residents in the United States do not have access in their homes to broadband service with download speeds of at least 3 Mbps and upload speeds of at least 768 Kbps, compared to only 0.3% of residents in non-rural areas (National Broadband Map, "Broadband Availability in Urban vs. Rural Areas", <http://www.broadbandmap.gov/download/Broadband%20Availability%20in%20Rural%20vs%20Urban%20Areas.pdf>)

²² Required speeds based on FCC estimates that broadband speeds of 4 Mbps download/768 Kbps upload are needed to stream standard definition video (Federal Communications Commission, National Broadband Plan, <http://download.broadband.gov/plan/national-broadband-plan-chapter-3-current-state-of-the-broadband-ecosystem.pdf> and residential availability of broadband service at speeds of at least 3 Mbps download/768 Kbps upload (National Broadband Map, "Broadband Availability in Urban vs. Rural Areas", <http://www.broadbandmap.gov/download/Broadband%20Availability%20in%20Rural%20vs%20Urban%20Areas.pdf>)

²³ National Telecommunications & Information Administration, "Digital Nation: Expanding Internet Usage", http://www.ntia.doc.gov/files/ntia/publications/ntia_internet_use_report_february_2011.pdf

Many geographically-isolated parts of the state may not have higher education institutions located nearby, and many rural K-12 education institutes rely on bus transportation that makes it difficult for students to stay late or arrive early to complete school work on site.²⁴ Increasing broadband adoption and technology use for education could assist in providing rural students access to a wider variety of courses, virtual schools, and collaborative learning opportunities outside of their immediate communities.²⁵

How Ohio is Integrating Technology and Learning

The state of Ohio has made the use of technology a priority at all levels of education. There are a variety of e-Learning options to both higher education and K-12 students in the state, and the Internet has become a valuable tool in improving access to these options. This emphasis on getting technology into the classrooms has resulted in several successful initiatives.

OhioLearns is a website targeted to any Ohioan who is interested in distance or e-Learning at the college level.²⁶ The website provides a catalog of online courses, degrees, and certificates available in Ohio and provides assistance to institutions that wish to assess their web-based services and to students enrolled in traditional colleges or universities who are interested in online tutoring. iLearnOhio is a website administered by the Ohio Resource Center, in collaboration with the College of Education and Human Ecology at The Ohio State University and the Ohio Board of Regents.²⁷ It is a virtual clearinghouse of online courses offered to Ohio students in grades K-12 with the goal of providing all Ohio students access to high-quality distance learning courses. These resources are intended to assist all Ohioans in harnessing the power of broadband to become better educated.

Digital literacy programs may also have an impact on increasing the use of technology for education in Ohio. A 2012 survey of Cleveland and Akron parents showed that nearly three out of four (73%) who had completed a digital training program said that the program had increased their ability to engage with their child's school teachers and learning.²⁸ Additionally, 80% of parents that completed the training reported that children now completed homework, schoolwork, or class projects using their home broadband service.²⁹

By becoming more digitally literate, parents can help educate their children not only about technology usage, but also online safety and etiquette. Connect Ohio's Every Citizen Online (ECO) program is aimed at increasing broadband adoption and digital literacy throughout the state. This program provides residents of Ohio six hours of free basic training sessions on computers, the Internet, and the benefits of using the Internet. Training is offered at more than 300 locations throughout the state, including libraries, community colleges, community action councils, Goodwill locations, YMCAs, workforce development centers, and other community anchor institutions. More than 26,000 Ohioans have taken advantage of the ECO program since it began in January 2011.³⁰

Conclusions

Broadband has the capability of making education a reality for a broad spectrum of Ohioans. Currently, approximately 2.9 million Ohio adults are using the Internet for educational purposes, and nearly 1.5 million Ohio children are using their home Internet service for schoolwork. However, there are many demographic groups that are not fully utilizing the educational opportunities available via technology. Increasing broadband availability and adoption among these groups, paired with improving digital literacy and awareness of online education applications, may open the door to more educational opportunities.

24 ICF International, Ibid.

25 ICF International, Ibid.

26 OhioLearns, <http://www.ohiolearns.org/ohiolearns>

27 iLearnOhio, <http://www.ilearnohio.org/>

28 One Community, *Connect Your Community K-12 Digital Literacy Survey*, <http://www.connectcommunity.org/wp-content/uploads/2012/06/CYC-K-12-parent-survey-summary-May-2012.pdf>

29 Ibid.

30 <http://connectohio.org/every-citizen-online>

Methodology and Definitions

Between March 8 and March 29, 2011, Connect Ohio conducted a random digit dial telephone survey of 1,201 adults across the state. Of the 1,201 respondents randomly contacted statewide, 201 were called on their cellular phones, and 1,000 were contacted via landline telephone. On average, each survey took approximately 11 minutes to complete. Data were collected by Thoroughbred Research Group in Louisville, KY. The results of this survey have been compared to similar surveys that Connected Nation conducted across ten states in 2011 (Alaska, Florida, Iowa, Michigan, Minnesota, Nevada, Ohio, South Carolina, Tennessee, and Texas). This research was designed to measure technology adoption trends and the awareness of available broadband service.

Internet users are defined as respondents who answered “yes” when asked “Do you subscribe to the Internet at home?” and answered “every day, several times per week, or once per week or less” when asked “How often, if ever, do you go online from home?” or who answered “yes” when asked “Do you use the Internet from any locations outside of your own home?”

Respondents who access the Internet via cell phone are defined as those who answered “yes” when asked “Is your cell phone capable of accessing the Internet” and answered “every day, several times per week, or once per week or less” when asked “How often, if ever, do you go online using your cell phone?”

Multiple attempts were made to each working telephone number on different days of the week and at different times of the day to increase the likelihood of contacting a potential respondent. To ensure a representative sample, quotas were set by age, gender, and census area of residence (rural or non-rural), and the results were weighted to coincide with 2010 United States Census population figures. For the purpose of setting quotas and weighting, “rural” respondents are defined as living in a census area that is not a part of a Metropolitan Statistical Area (MSA), as designated by the United States Office of Management and Budget. Weighting and design consultation were provided by Lucidity Research.

Surveys were conducted by Thoroughbred Research Group. Based on the effective sample size, the margin of error = $\pm 3.03\%$ at a 95% level of confidence for the statewide survey of 2011. As with any survey, question wording and the practical challenges of data collection may introduce an element of error or bias that is not reflected in this margin of error.



Appendix A:

Select Sample Sizes

	Connected Nation Average (<i>n</i>)	2011 Ohio (<i>n</i>)
Total	12,004	1,201
Internet use at home or someplace else	9,555	953
Access the Internet via Cell Phone	3,573	318
Have Children at Home	4,158	431

Demographic Categories	2011 Ohio (<i>n</i>)	Ohio Internet Users (<i>n</i>)	Ohio Households with Children (<i>n</i>)
Rural	401	305	145
Non-Rural	800	648	286
Age 18-24	77	69	31
Age 25-34	237	215	157
Age 35-44	213	190	141
Age 45 and older	674	479	102
Households with Annual Incomes Less than \$25,000	267	149	75
Households with Annual Incomes \$25,000-\$49,999	280	238	112
Households with Annual Incomes \$50,000-\$74,999	178	165	68
Households with Annual Incomes \$75,000 or more	239	235	120
Caucasian	980	786	347
Black, or African American	93	74	38
Other Minorities	53	43	30
No college education	513	330	152
At least some college education	653	597	272
Female	626	490	220
Male	575	463	211