



Access and Impacts:

Exploring how internet access at home and online training shape people's online behavior and perspectives about their lives

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Summary of Findings

Internet access for Americans has taken on new urgency since the pandemic. Prior to it, many people without a home broadband connection could manage, perhaps using a smartphone for web surfing or taking a computer to the library to use Wi-Fi for more data-intensive applications. But the pandemic exposed the limits of wireless data plans for schoolwork or working from home, as well as the severe consequences of having limited or no access to the internet at home.

Yet the process of getting people connected who have not had home service (or service on a consistent basis) is not well understood. The availability of internet offers for low-income households is a start, and these offers help increase adoption rates beyond what otherwise would be the case. At the same time, home access in itself is not always enough; since the [pandemic, some students](#) do not log onto virtual school even if they have been provided a data plan and computing device. [Anecdotes](#) such as these suggest a number of questions about broadband adoption are worthy of inquiry:

- How does having access at home shape people’s online behavior?
- What factors may influence people’s online behavior once they subscribe?
- Does having home internet access affect how people view their lives?

This research addresses these questions through a survey of subscribers to Comcast’s Internet Essentials program. The 2020 survey was fielded prior to the pandemic; it has a total of 618 respondents. The research also has a longitudinal design by which 218 respondents from a 2018 survey were called back in 2020. This allows analysis of the change in many metrics over time. The research also contains a comparison group, that is, a nationally representative survey of households similar to the IE customer base.

A study of Comcast Internet Essentials customers finds that home broadband service has...
A home access effect: 81% of IE subscribers say it helps a lot in carrying out online tasks, which in turn is correlated with:
<ul style="list-style-type: none"> • Acquiring more computing devices • Expanding the scope of online activities • Optimism about the future
A digital skills effect, which is limited to the 34% of IE users who have had formal digital skills training.
<ul style="list-style-type: none"> • Skills training is linked to higher levels of confidence in digital skills • This, in turn, has a link to greater internet use for education and other purposes • There is a correlation between digital skills training and people’s optimism about their futures
Looking at people’s digital skills training experience shows that:
<ul style="list-style-type: none"> • Education is a large motivator for pursuing training • Learning how to better manage privacy and security of personal information also plays a role • Both in-person and online modes of training matter to users. • The time and location of training matters to those who pursue it, and many say a time that better fits their schedules would improve the training experience.

The survey points to two elements that influence the online experience of Internet Essentials customers. The first is a home **access effect**, that is, how having a home internet subscription shapes how people view of the internet's utility. Those who say that, since subscribing to IE, the internet helped "a lot" in carrying out online tasks do more online activities than those who do not share that view. They have acquired more digital access tools since 2018. This group of IE users also has a more positive rating of where their lives stand – both today and in five years.

The other element is a **digital skills** effect. It is a more muted impact than the home access impact, in part because one-third of respondents say they have pursued formal digital skills training at places such as public libraries or local schools. Those who have had digital skills training exhibit higher levels of confidence in their ability to do things online, which in turn has an impact on the scope of their online activities. IE users with high levels of confidence in digital skills report modestly higher views on how they rate their lives in the future.

These two effects show that discount internet plans, as well as wrap-around services such as digital skills training, have the potential to make a difference in people's lives. In that context, it is worth noting that this sample of IE users is racially and ethnically diverse; 42% are African American and 23% are Hispanic. Half (52%) report annual household incomes of \$30,000 or less. The report's findings show the potential for home internet access to open doors of opportunity for those with fewer resources.

Here are some datapoints from the survey that illuminate these findings.

A large majority of IE users say that having home broadband service helps "a lot" in their ability to carry out online tasks.

- Nearly all respondents (about 93%) reported using the internet before having a home connection through a cell phone or another device, so internet use is not foreign to IE subscribers. Yet 81% said a home connection improved their ability to use the internet "a lot" and 15% said it improved their ability to use the internet "somewhat." For those who said that having home service helped "a lot":
- 81% streamed video to their TV or internet-connected devices, while 62% of all others did (i.e., those who did not say the internet helped "a lot" in carrying out online tasks).
- 75% used the internet for schoolwork compared with 53% of all others.
- 60% shopped online, compared with 41% of all others.
- 51% accessed government services versus 31% of all others.

Perceptions about the internet's utility may also contribute to IE users acquiring more digital hardware tools over time.

- Ownership of computers for IE households grew from 66% to 68% from 2018 to 2020, compared to a slight decrease in computer ownership for similar households in the American Community Survey (ACS).
- IE users also showed a growth in smartphone adoption from 80% in 2018 to 90% in 2020; those figures are comparable to patterns from ACS data.

Fewer than half (45%) of IE subscribers have had digital skills training – some formally at places such as public libraries and others from family, friends, or neighbors.

- One-third (34%) of all respondents had formal digital skills training on how to use the internet and computers since subscribing to Internet Essentials. This sort of training plays out at public libraries (18%) and local universities (15%).
- Some 42% of IE respondents say they have had some sort of training or help from friends, family (including children), or people in their neighborhood.

Among those who have received formal training, 63% said the time and location of the training was helpful to them. Some 39% said having classes that would better fit their schedule would have improved the training. This suggests that proximity and scheduling play a role in some people's decisions on whether to pursue training.

Digital skills training is related to IE users' online behavior. The 34% of those who have had some formal digital skills training (e.g., on the job or at a public library) engage in more online activities than those without.

- 78% of those with digital skills training used the internet for schoolwork compared with 62% of those without such training.
- 65% of those with digital skills training used the internet to look for health or medical information compared with 46% of others.
- 56% of IE users with digital skills training looked for or applied for a job, while 40% of those without such training did.

Out of 7 activities, those with digital skills training engaged in an average of 4.6 while those who received no training did 3.6, indicating how digital skills training can impact the scope of people's online activities.

Digital skills training is correlated with confidence in digital skills.

Respondents were asked to state their level of confidence in carrying out a series of nine online tasks, such as creating a resume, looking for a job, or finding reliable health care information. People generally reported high levels of confidence in their ability to do these things. Out of the 9 online activities on which respondents were queried about confidence in online skills, respondents were "very confident" in 6 of them. Some 49% of all respondents were confident in 8 or more – we designate them as highly confident users – and 33% were confident of 4 or fewer – they are less confident users.

There is a relationship between digital skills training and confidence in carrying out online tasks. Among those with formal digital skills training, 61% were very confident in carrying out eight or more tasks, while that figure was 43% for those who were less confident users. More specifically, 82% of those with digital skills training were "very confident" in their ability to find educational content and information online compared with 63% for those who were less confident.

IE users who are very confident about their digital skills are more likely to engage with online school, financial, and government services.

- 76% of IE users highly confident in their digital skills used the internet for schoolwork compared with 47% who reported lower levels of confidence in digital skills.
- 72% of the highly confident used the internet for access banking and financial services compared with 35% for the less confident.
- 53% of the highly confident used the internet to access government services versus 28% for the less confident.

Out of a set of 7 online activities, IE users who are highly confident in their digital skills reported doing 4.6 and those who were less confident engaged in an average of 2.6 of them. For practitioners in the digital inclusion field, this suggests that tracking the confidence of clients' use of digital tools may be a useful proxy for the impact of training on engagement with the internet.

The longitudinal design allows comparison of five online activities between 2018 and 2020. Households surveyed in both years generally used the internet more in 2020 than they did in 2018.

- Some 75% of IE users reported using the internet for schoolwork in 2020 compared to 62% for those same users in 2018.
- 70% of IE users in 2020 had streamed video compared with 62% in 2018.
- 56% in 2020 said they used the internet for banking and financial services, up from 47% for these same respondents in 2018.
- 41% of respondents said that in 2020 they used the internet to access government services, an increase from 28% for the same users in 2018.

IE's "access effect" – the notion that home access is a boon to carrying out online tasks – may manifest itself in how people view their lives.

Evidence of the direct impacts of having a home broadband connection on people is hard to come by, in that it is difficult to design studies that can establish a link between home internet access and household income or educational attainment. For that reason, social scientists look for variables that might approximate impacts. One technique is to ask people how they rate their lives on a scale of 1 to 10 – both today and five years into the future. Research has shown higher (or increasing) life ratings translate into increases in income. For this sample of IE users, the average life rating for respondents in 2020 was 7.0 when thinking about their lives today and 8.4 when thinking about how it would be in five years.

Analysis of IE users' assessment of their lives shows a correlation between the "access effect" and how they evaluate their lives five years into the future. Statistical analysis shows that, for IE users who say that home broadband helps "a lot," life ratings for today and in five years is 0.8 points higher than for other respondents. That is nearly one additional rung on the 1 to 10 life scale ladder. This does not necessarily mean that having IE causes people to be more optimistic about their future; it could be that the attitude that home access helps a lot with online tasks also captures qualities that influence how people view their futures. Yet the findings do capture the potential of home broadband access to help improve the outlooks of low-income internet adopters.

Education is the most important motivator for pursuing digital skills training.

- 54% of those who have had digital skills training say that helping their children with their homework was one reason they sought training and a plurality listed it as the most important reason.
- 42% said one motive was to learn how to better manage the privacy and security of their personal data, but only two percent reported it as the most important.

Both in-person and online modes of digital skills training are important to people.

- One-third (30%) of those who had digital skills training said that instruction was mostly online, while 49% said it was a combination of online and offline and 22% said it was mostly offline.
- Half (50%) said more one-on-one instruction would have improved the training experience.
- Almost half (47%) said training would have been better if online resources were easier to use.

Introduction

The COVID-19 pandemic has changed how policymakers and other stakeholders think about the internet. As schools and businesses closed, the home internet adoption gaps at home became more visible. Many children expected to log on to school did not show up for class either because they lacked a high-speed internet connection at home or a computing device. Not all employees could work from home due to the same constraints. Telehealth, though an attractive option in lieu of office visits, was out of reach for the [42% of older adults](#) without home wireline broadband connections.

Yet even as an apparent consensus emerges about the indispensability of having a home internet connection, questions remain about the process of home internet "on boarding" and how it impacts people's lives. Does merely connecting a household with a subscription and access devices do the job? Or is additional support necessary? Will well-intentioned efforts to help people acclimate to home connectivity make a difference? Is having broadband service at home likely to change outcomes in people's lives, such as improving educational results or economic prospects?

This research addresses these issues through a survey of customers of the Comcast Internet Essentials (IE) low-income home broadband offer. The research follows on a July 2018 survey of 1,275 Internet Essentials customers. The 2020 survey had a callback element, by which 218 2018 respondents were interviewed again in March 2020 (interviewing concluded before the pandemic caused shutdowns of schools and businesses in the United States). This longitudinal design offers a chance to repeat a number of questions in 2020 from the 2018 survey, which allows examination of change through time. The 2020 survey also included an additional 400 respondents in the sample for an overall sample size of 608 for 2020. Finally, the research included an online survey from a nationally representative panel of lower-income households to put results from the IE respondents in context.

I. Home Access and Perceptions of the Internet's Utility

A high-level look at the results reveals several things. First, nearly 9 in 10 (87%) of those interviewed in 2018 continued to be Comcast Internet Essentials (IE) customers in 2020. Although a follow-up question to those who did not keep service had a small sample size (just 29), about one-third said they had some other type of wireline subscription (e.g., fiber, DSL, or cable).

The second finding of interest is the change in ownership of digital tools. IE households exhibited an increase in ownership of a desktop or laptop computer, with 68% reporting that they had one of those in 2020, up from 66% in 2018. Although the increase is small, it is noteworthy because computer ownership nationally has stagnated. These figures take advantage of the study's longitudinal design and compares those contact in 2018 to those contact in 2020. Smartphone adoption also increased from 82% in 2018 to 90% in 2020.

As points of comparison, smartphone ownership increased from 86.6% in 2019 up from 84.4% in 2018 and 81.8% in 2017, according to the [American Community Survey \(ACS\)](#). The comparison group sample shows that 90% have smartphones. This puts the IE sample's smartphone adoption in line with national figures and the control – perhaps even a bit ahead of the national average. At the same time, half (51%) of IE respondents report annual household incomes at \$30,000 or less and 68% report being under the age of 50. Looking at households who incomes are at or below 135% of the poverty and whose heads are between the age of 18 and 49 shows that 91.6% have smartphones. IE households are also more likely than average to have school-age children living at home; some 67% do, more than twice the national average. Among households with school-age children and income below 135% of the poverty level, 91.6% have smartphones. Overall, the IE sample's smartphone adoption rate looks to be in line with national figures.

For computers, the ACS shows steady numbers, with 77.3% of households saying they have a desktop or laptop computer in 2019 compared with 77.5% in 2018 and the same figure for 2017. The figure for the comparison

group is 64% (compared with 68% for the IE sample). Among households with school-age children with incomes below 135% of the poverty level, ACS shows that 61.8% have a desktop or laptop computer. Some 62.8% of households whose incomes are below 135% of the poverty level and whose heads are under age 50 have a desktop or laptop computer. The IE sample then, with 68% having a computer in 2020, performs somewhat above the norm on computer ownership.

Finally, IE users showed a small decrease in having tablet computers. Some 52% reported having a tablet computer in 2018, with 49% saying this in 2020. ACS shows that 61.5% of all households had a tablet computer in 2019, slightly down from the 62.5% figure for 2018. Among households whose incomes are below 135% of the poverty level and whose head is under the age of 50, 51.1% reported having a tablet in the 2019 ACS. For households with children whose income is below 135% of the poverty level, the figure for tablet computers is 57%. The IE sample looks largely in line with national tablet computer adoption patterns, or perhaps a bit behind the norm.

One consequence of having a home broadband connection is the perceived improvement in the ease of accomplishing tasks online. Respondents were asked how much, since subscribing to Internet Essentials, their ability to do things online that are important to them had improved. Four out of five – or 81% – said having Internet Essentials helped “a lot” in improving their ability to carry out important tasks online. This phenomenon is particularly prevalent among households with children; 84% said IE helped “a lot” in carrying out online tasks compared with 75% of the rest of the sample.

This finding is striking because nearly all IE subscribers had other means of accessing the internet before they had a home connection, implying that it was home broadband access itself that made the difference. Many IE respondents had a smartphone before having a home wireline subscription service, so with that (and perhaps access at places such as public libraries, where nearly half in 2018 reported using the internet prior to IE) they had tools for accomplishing online tasks. But those tools clearly had limits, as the convenience of a high-speed option at home altered people’s perceptions of the ease of doing things on the internet.

Expanding Scope of Online Activities

IE users’ notion that home service helps “a lot” masks detail about how that access affected respondents’ online behaviors. To that end, the survey asks respondents if they had ever done any of seven activities on the internet. The table below shows those results and how they differ depending on whether people say IE has helped “a lot” in improving their ability to complete important tasks online.

These sizable differences indicate how home broadband access can affect people’s perceptions of how the internet can help them do things that are important to them. The survey for this report shows how confidence

Table 1: Online Activities

	All 2020 IE Respondents	IE helps a lot	All Others
Stream videos to your TV or other internet-connected devices	72%	81%	62%
Do schoolwork	66%	75%	53%
Get access to banking and financial services	59%	66%	50%
Look for health or medical information	53%	57%	41%
Shop	53%	60%	41%
Get access to government services	44%	51%	31%
Look for or apply for a job	44%	50%	37%
Total activities (Out of up to 7)	3.9	4.4	3.1

in digital skills shapes the incidence of online activities.

As the table below shows, most people are “very confident” in their ability to carry out various online tasks. However, one-fifth (21%) of the sample is very confident about none or one of these tasks (out of nine) and nearly half (49%) are very confident in eight or more.

Out of the nine activities listed, respondents said they were very confident about 5.8, on average. Respondents

Table 2: Confidence in Digital Skills

	Very Confident	Somewhat Confident	Not very confident	Not at all confident
Find educational content and information	70%	18%	3%	10%
Look for a job	69%	14%	5%	12%
Find reliable information about a health or medical condition	67%	20%	3%	10%
Access online banking or financial services	67%	16%	5%	12%
Look for housing	63%	19%	6%	13%
Find a course or training materials to improve your job skills	63%	20%	5%	13%
Create a resume	61%	23%	6%	10%
Improve your job skills	60%	20%	7%	12%
Access or apply for government services	60%	21%	6%	14%

who are more confident engage in more online activities. For the purpose of this analysis, we define a respondent as “highly confident” if they are very confident in at least eight of the items and “less highly confident” if they are very confident zero or one activity. Not surprisingly, those who are more confident online are more likely to engage in online activities.

People’s confidence in their digital abilities and their actual abilities may not coincide perfectly. It would come as no surprise to find that people over-estimate their actual capabilities. The survey does not allow insight into that phenomenon, but it did ask respondents whether they had any training on how to use computers and the internet.

Table 3: Training in Digital Skills

	All 2020
Your children	31%
Friends or other family members	29%
A local public library	18%
Your job	17%
A local school, university, or community college	16%
A community program	11%
Someone in your neighborhood	9%

Overall, 49% of respondents reported having any training or help since subscribing to Internet Essentials and 34% had formal training from a local school, public library, or community program. Those with formal training on how to use the internet are more likely to engage in the online activities (an average of 4.6 activities) listed than those without training (3.6 activities).

The survey offers some insights into characteristics of formal training that mattered to the 34% who participated. About half (48%) said it was helpful that the time and location fit their schedule. One-third (31%) said that a class time that would better fit their schedule would have improved the training. It seems plausible that the convenience of training options (i.e., whether the time and location of training is suitable) looms as an issue for some who do not opt for formal skills training.

The data show a relationship between the incidence of formal training and confidence in carrying out tasks online. The greater degree of confidence in digital skills (as measured by the number of tasks people are very confident in doing) and the more training options people have pursued (as measured by the number of “yes” answers to the question on training) are positively correlated. This shows up in comparing levels of confidence in digital skills for those with and without formal training. The mean value for confidence in digital skills is 5.4 for those who have had no formal training and 6.8 for those with at least one formal training activity. At the same time, the greater incidence of doing online activities for those with training is comparable to the pattern for those very confident in completing a wide range of tasks.

Table 4: Training and Online Activities

	All 2020	Have received help of formal training	Have received help or training from friends or family	No training
Do schoolwork	66%	78%	73%	63%
Get access to government services	44%	56%	53%	42%
Look for health or medical information	53%	65%	67%	45%
Shop	53%	60%	60%	50%
Look for or apply for a job	44%	56%	57%	41%
Get access to banking and financial services	59%	69%	67%	57%
Stream videos to your TV or other internet-connected devices	72%	77%	83%	72%
Average total activities (Out of up to 7)	3.9	4.6	4.6	3.7

As has been discussed in prior research, the differences in the incidence of online activities associated with having had digital skills training may not be due to the training itself. That was an issue “[Reaching the Unconnected](#)” explored in the first phase of this research. Those seeking training may be highly motivated people who, absent training, might have been done more online over time. That research showed, however, that having had digital skills training on the internet or computers has a positive impact on people’s internet use – even when taking into account respondents’ prior levels of motivation.

II. Internet access and life aspirations

To what end? That is an enduring question when thinking the impacts of online access. It is one thing to note the importance of online access for school in the context of a pandemic. It is another to ask whether having a home internet changes educational outcomes or economic prospects. This survey does not have data on, say, student’s grades or test scores to assess whether home service made a difference. Although the survey asks about household income, it obtains data on income ranges (e.g., whether a household’s annual income is between \$20,000 or \$30,000) and about one-third of respondents do not provide this information. The income measure is useful for identifying socioeconomic status, but the income groupings are too large and the surveys do not cover enough time to identify any income effects.

In order to examine the impact of having home broadband service, this analysis borrows on academic work that has looked at how people view their life prospects and its connection to steps they may take to change them. Social psychologists have explored links between people’s reported views about their level of life satisfaction and outcomes, such as future income or health. People who report higher levels of where they stand in their lives may see better chances for upward mobility – and in turn invest in their future. A study over a five-year period in the late 1990s found a [positive correlation](#) between expectations about the future and higher incomes. Other [research](#) makes a causal claim that higher level of life satisfaction has a relationship to higher income a decade later. Thus, if we assume that higher reported life satisfaction measures are correlated with higher future income, then a positive relationship between having a broadband connection and life satisfaction may proxy for a correlation between a broadband connection and higher earnings. That correlation does not necessarily mean causality, of course, an issue we discuss later.

This work follows the approach of Graham in investigating people’s life satisfaction through two survey questions that the Gallup Organization has used. The first asks about today and is:

Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally stand at this time?

A follow-up question is the same but asks for people to respond on where they think they will be on the ladder in 5 years.

In this survey, respondents, on average, placed their life at 7.0 on the ladder today and 8.4 five years into the future. For context, 2005 responses for this “best possible life” (BPL) question found that lower income Americans reported scores of 6.6 and 7.1 (respectively for the poorest and second income groups). With having lower incomes being a qualification criterion for IE, the figure for BPL today for IE respondents looks roughly congruent to past results. For BPL five years on, the average score was 8.4. The higher level for the future makes sense, given that two-thirds of this sample is either African American or Hispanic and that past research has shown these groups to be more likely than others to report higher future scores. Respondents in the control group rated their life at 6.3 for today and 7.5 in five years; the control group has a higher share of older adults than the IE sample and older people generally have lower life rating scores.

To explore what having the internet may have to do with life satisfaction, the research used regression analysis to model life satisfaction for respondents as a function of three key variables of interest:

- Whether having IE helped “a lot” in carrying out tasks online.
- Whether the respondent had training on how to use the internet or computers, i.e., a dummy variable whose value is 1 for the 34% of respondents who had formal training.
- The respondent’s self-reported confidence in their digital skills – a scale of the number of items (out of 9) the respondent said they were “very confident” they could complete online.

The ordinary least squares regression also includes socio-economic variables such as income, whether a household has children, education, race/ethnicity, and employment status. It also includes a measure of whether respondents have, in the past month, felt unable to control events in their lives; 16% said this was true for them frequently and 29% said it was true sometimes. Regressions were conducted with respondents’ ratings on their

lives today and their lives in five years into the future. Since each of the three variables listed above are related to each other, three separate models were run to focus on the results for each of the three variables.

The following table shows results for how people assess their lives today looking at the three key variables that capture how internet access may impact how people assess their lives. Column 1 shows the relationship between formal internet training and life satisfaction, column 2 the relationship between whether having IE helped carry out online tasks and life satisfaction, and column 3 the number of tasks a respondent felt comfortable doing online and life satisfaction.

The first table looks at how people rate their lives today, starting with results for whether they had formal training on how to use the internet or computers.

Table 5: Relationship Between Internet Use Characteristics and Life Satisfaction

Mean of dependent variable	Life Satisfaction		
	7.1		
Formal Training	0.28 (0.25)		
IE helped "a lot" in carrying out online tasks		0.80** (0.33)	
Number of "very confident" responses to carrying out online tasks			0.13** (0.04)
Age 65+	0.27 (0.46)	0.37 (0.53)	0.43 (0.46)
African American	0.28 (0.28)	0.35 (0.29)	0.33 (0.27)
Hispanic	0.71** (0.34)	0.81** (0.35)	0.78** (0.34)
Employed Full-Time	0.16 (0.27)	0.31 (0.28)	0.00 (0.28)
Frequently unable to control life	-0.20 (0.33)	-0.18 (0.34)	-0.21 (0.32)
Less than high school grad	0.14 (0.50)	-0.10 (0.54)	0.22 (0.49)
High school grad	-0.44 (0.36)	-0.55 (0.39)	-0.41 (0.36)
Some college	-0.70** (0.35)	-0.94** (0.37)	-0.70** (0.34)
Income <\$20K	-0.80 (0.67)	-0.47 (0.76)	-0.72 (0.66)
Income \$20K-\$40K	-0.81 (0.69)	-0.49 (0.76)	-0.78 (0.68)
Income \$40K-\$75K	-0.66 (0.76)	-0.66 (0.83)	-0.69 (0.75)
More than 2 kids	-0.37 (0.26)	-0.38 (0.27)	-0.25 (0.26)
Constant	8.00*** (0.73)	7.19*** (0.82)	7.20*** (0.76)
Observations	365	324	365
Adjusted R-squared	0.01	0.03	0.04

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results show that having formal training in digital skills has no association with how people assess their lives in the present day. However, the regression finds a positive and statistically significant relationship between life satisfaction and whether the respondent said IE helped "a lot" in carrying out online tasks and the number of online activities with which the respondent felt comfortable doing.

In terms of magnitude, these relationships seem meaningful. Those who say IE helped "a lot" with online activities have a life satisfaction score 0.8 points higher than those who do not—almost a full rung higher on the ladder. Similarly, each additional online task a respondent feels comfortable doing is associated with 0.13 additional points on the life satisfaction score. As a result, someone confident with all nine listed tasks would score almost 1.2 points higher on the ladder than someone who is confident with none, all else equal.

The only statistically significant coefficients among the other independent variables show that Hispanics have higher assessments of their lives than do others, and people with some college rate their life satisfaction lower than people with at least college degrees (the excluded category).

The next set of results look at how people answer the question about where they think their lives will be in 5 years. As the table below shows, the primary difference from the results above is that formal training becomes statistically significant, showing a positive relationship with expected life satisfaction in five years. The other two variables, whether IE helped "a lot" with online tasks and the number of tasks the respondent felt "very confident" doing, stayed statistically significant and similar in magnitude.

Table 6: Relationship Between Internet Use Characteristics and Life Satisfaction in Five Years

Mean of dependent variable	Expected Life Satisfaction in Five Years		
	8.7		
Formal Training	0.50** (0.21)		
IE helped "a lot" in carrying out online tasks		0.88*** (0.26)	
Number of "very confident" responses to carrying out online tasks			0.12*** (0.03)
Age 65+	-0.76** (0.38)	-0.67 (0.41)	-0.60 (0.38)
African American	0.75*** (0.23)	0.75*** (0.23)	0.81*** (0.23)
Hispanic	0.48* (0.28)	0.54** (0.27)	0.58** (0.28)
Employed Full-Time	0.44* (0.23)	0.51** (0.22)	0.31 (0.23)
Frequently unable to control life	-0.11 (0.27)	-0.14 (0.26)	-0.12 (0.27)
Less than high school grad	0.22 (0.41)	0.29 (0.42)	0.28 (0.41)
High school grad	0.13 (0.30)	0.07 (0.30)	0.15 (0.29)
Some college	0.21 (0.29)	0.12 (0.29)	0.24 (0.28)
Income <\$20K	-0.96* (0.55)	-0.69 (0.59)	-0.88 (0.54)
Income \$20K-\$40K	-0.98* (0.57)	-0.78 (0.59)	-0.96* (0.56)
Income \$40K-\$75K	-1.06* (0.63)	-1.00 (0.64)	-1.07* (0.62)
More than 2 kids	-0.41* (0.21)	-0.26 (0.21)	-0.31 (0.21)
Constant	8.95*** (0.60)	8.16*** (0.64)	8.27*** (0.63)
Observations	365	324	365
Adjusted R-squared	0.09	0.09	0.11

People who are employed today are optimistic about their futures. And both Blacks and Hispanics have positive perspectives on the future. The model asking people to rate their lives in five years, with an adjusted R-squared of 0.09 – 0.11, depending on the specification, explains more variation than the one that asked respondents to rate their lives today. In that model, having had formal digital skills training does have a significantly positive impact on how people rate their lives in five years – by an increment of 0.5. Older adults report significantly lower scores about their lives 5 years hence, although in only one specification is it statistically significant.

Discussion

The following table summarizes the results of the models run for how people rate their lives today and in five years.

	Life rating today	Life rating in five years
IE helps “a lot” in carrying out tasks	Positive and significant	Positive and significant
Confidence in digital skills	Positive and significant	Positive and significant
Formal internet training	Not significant	Positive and significant

Across a number of different models, there is generally an association between internet access and how people view their lives (both today and in the future).

Two kinds of effects seem to emerge. One is a home access effect, which refers to the question on whether having IE home internet service helps “a lot” in carrying out tasks. This captures people’s reactions to having a wireline connection that operates at 25 Mbps broadband speeds, typically compared to previously using only a smartphone or using the internet at another location. As the finding on how people rate their lives five years into the future, this phenomenon can (relative to other findings) have a sizable effect of 0.8.

Although this research does not examine the reasons behind the home access effect, other research sheds some light. Earlier research on IE find that strong majorities of IE subscribers say that the internet helps them save time and manage their schedules. [Specifically](#):

- 84% say this statement describes them “very well” (58%) or “somewhat well” (26%): “The internet helps me save time for day-to-day activities.”
- 77% say the internet helps them “a lot” (53%) or “somewhat” (24%) to manage their schedule to facilitate meeting family needs.

These datapoints suggest that convenient online access may alleviate some of the [psychological burdens](#) associated with poverty, namely the strains associated with having to manage ways to make ends meet.

The other is a **digital skills** effect, which is to say those having had formal training or with high confidence in digital skills report higher life satisfaction ratings. The formal training effect is significant only in the model that examines life ratings five years into the future. The role of confidence in digital skills is significant for life ratings today and in five years.

Another point to bear in mind is interpreting how the findings translate into actual impacts in people’s lives. If having IE service means people’s view of their lives is 9 and not 8, it is not clear what this might mean on household income or academic achievement.

Findings in other contexts help interpret the ones here. A [2012 study](#) found that a 1 standard deviation increase in life satisfaction was associated with a 5% increase in earnings from respondents’ age 22 to age 29 years. Put differently, a 1-point increase (on scale of 1 to 5, meaning for this study the increase would have to be 2, given our scale of 10) in life satisfaction was linked to a \$2,000 increase in earnings. The technique of asking people to rate their life satisfaction also appears in cross-country comparison. A 1-point difference ([for 2018 data](#)) is the

difference between living in the United States (6.88) and Japan (5.79). The result for Russia was 5.51. In the Internet Essentials sample, impacts are no more than 0.8 points suggesting that the effects identified in the IE sample, even if significant in several models, are not large in magnitude.

At the same time, the consistent finding that interventions to improve people’s broadband capabilities is important. The internet’s effects on people’s health, educational attainment, and income are not well understood. There is [evidence](#) that, in the aggregate, increases in internet adoption have positive economic impacts in non-metro U.S. counties. There is also [evidence](#) that discount internet offers boosts broadband adoption rates in places that have them at a rate greater than what would otherwise be the case. But there is little evidence available on whether interventions to help people get online (e.g., discount internet offers or digital skills training) translate into positive outcomes for the individuals subject to such interventions.

This research shows that having wireline service has a significant association with how people rate their lives – as does digital skills training and high rates of confidence in digital skills. Although it may be tempting to be skeptical about the effectiveness of interventions to improve the broadband experience for low-income households, this research does not support such skepticism. It is important to emphasize, though, that the findings show correlations between internet access and life rating, not a causal relationship. People’s positive views on whether IE helps in carrying out tasks may also capture optimistic perspectives on their lives that have nothing to do with the internet. Those other perspectives may help explain positive life ratings, not home broadband access.

At the same time, the findings suggest further inquiry. If, for instance, digital skills training and wireline home internet access improves people’s outlooks, can these interventions be improved so that their impacts are greater? If we can gain an understanding of other interventions that improve people’s outlooks, can interventions related to home internet access and skills buttress their impacts?

III. Longitudinal Design

The other important feature of this research is its longitudinal design. In 2018, 1,275 Comcast IE subscribers participated in a survey and, for the March 2020 survey, a total of 218 were recontacted. This longitudinal design allows analysis of change over time of respondents’ perspectives on online use and other things. This approach yields several findings:

Over time, IE users do a wider range of online activities: As the table below shows, IE respondents were asked about the same five online activities in 2018 and 2020. Over time, they report greater likelihoods of using the internet for schoolwork, access to government services, banking and financial services, and streaming video over the 2018 to 2020 time frame. The mean number of activities grew from 2.4 to 2.8.

Table 7: Internet Activities Over Time

	2020	2018	Control
Do schoolwork	75%	62%	48%
Get access to government services	41%	28%	48%
Look for or apply for a job	39%	41%	55%
Get access to banking and financial services	56%	47%	32%
Stream videos to your TV or other internet-connected devices	70%	62%	68%
Total activities (max 5)	2.8	2.4	2.2

Analysis of what may be driving the growth in incidence of online activities points to two factors. The first is the smartphone. For IE respondents who report having gotten a smartphone since 2018, the average number of online activities was 3.1; the mean figure for those respondents was 1.5 in 2018.

The other element is digital skills training. Although the overall incidence of training decreased over the 2018 to 2020 time frame, an increase in the count of the different training opportunities cited (and 20% fit this category), was associated with a wider range of online activities. For those respondents, the mean number of online activities was 3.4 for 2020 and 2.6 in 2018.

IV. The Training Experience

Having had digital skills training is related to people’s online behavior, but the survey also explores the nature of the training experience.

Among respondents who had sought any training or help on using computers and the internet, a majority (58%) said it was to help their children do their schoolwork. Nearly half (45%) said improving their ability to manage the privacy and security of the personal data was the motivation behind digital skills training. One-third (32%) said it was because they wanted to find a job.

Table 8: Motivations for Pursuing Training

	All 2020
Help my children do their homework	58%
Improve my ability to manage the privacy and security of personal data	45%
Find a job	32%
Obtain a certification for a job I have or want to pursue	28%
Better manage health or medical care	26%
Find a place to live	20%
Start a business or earn income online	21%

When pressed to identify the most important reason for seeking training, education rose to the top, with one-quarter (26%) citing that, with general digital skills and workforce issues (either job search or workforce skills) following at 18% and 16%.

Table 9: Most Important Reason to Pursue Training

Education (self or child)	26%
Digital skills	18%
Job search or skills	16%
Access banking/financial services	7%
Health care or medical information	7%
Housing	5%
Access government services	3%
Learn about security/privacy	2%
Childcare	1%
Don't know/other	16%

One thing to note is that, among those who undertook digital skills training, the training touched on a range of issues. Respondents said the following when asked which issues the training helped them address.

Table 10: Topics Covered in Training

	All 2020
Accessing health information	77%
Protecting the privacy and security of your personal information	74%
Improving your skills for the workforce	72%
Learning to better manage your money and finances	70%
Communicating with your children’s teachers and school	69%
Learning how to access government services through the internet	66%
Finding housing	62%

Beyond motives and interests, the survey also explored respondents’ experience of the training process. Word-of-mouth and trusted institutions led the way in informing respondents about training opportunities. Some 42% learned about it from a family member or friend, 33% from a school, and 15% from a local public library. About one-fifth (22%) learned about it from Comcast Internet Essentials.

Table 11: Where People Found Out About Training

	All 2020
From a friend or family member	42%
A school	33%
Comcast Internet Essentials	22%
A community organization	12%
Your local public library	15%
A religious institution	6%

The mode of instruction was mixed. Some 30% of all respondents said their digital skills training was mostly online, while 22% said it was mostly offline (e.g., in classes or one-on-one instruction) and 48% said it was a combination of online and offline. The importance of both online and offline modes of instruction is underscored when respondents are asked about what might have improved their training. Half (50%) said more one-on-one instruction would have helped and 48% said that training would have been better if online resources were easier to use. About four out of ten (39%) said curriculum that was more relevant to the topic in the course would have helped and 31% said a class that better fit their schedule would have improved training.

Demographics of the 2020 IE sample and the control group

	Internet Essentials sample	Control group sample
Gender		
Male	29%	40%
Female	71	60
Age		
18-29	21%	28%
30-49	47	30
50-64	17	26
65+	9	17
Don't know/refused	6	0
Marital status		
Married	20%	21%
Living with a partner	9	19
Divorced	17	20
Separated	9	3
Widowed	4	11
Never been married	36	26
School-age children at home		
Yes	63%	61%
Education		
Less than high school	12%	16%
High school graduate	33%	36%
Some college (includes community college)	32%	34%
College degree or more	17%	14%
Employment status		
Employed full-time	39%	16%
Employed part-time	16%	23%
Not employed	38%	61%
Retired	21%	29%
Race/ethnicity		
White	32%	51%
Hispanic	23%	19%
Black or African American	42%	17%
Income		
Less than \$10,000	17%	
\$10 to under \$20,000	21	39%
\$20 to under \$30,000	14	47%
\$30 to under \$40,000	7	14%
\$40 to under \$50,000	5	
\$50 to under \$75,000	2	
\$75 to under \$100,000	2	
\$100 or more -	1	
Don't know/Refused	32	

Demographics of the 2020 IE sample:

Newly contacted and those recontacted from 2018

	Recontacts	New in 2020
Gender		
Male	26%	31%
Female	74%	69%
Age		
18-29	17%	24%
30-49	55	42%
50-64	16	18%
65+	11	8%
Don't know/refused	2	9%
Marital status		
Married	23%	18%
Living with a partner	9	9
Divorced	17	13
Separated	9	9
Widowed	4	4
Never been married	36	37
School-age children at home		
Yes	67%	60%
Education		
Less than high school	15%	10%
High school graduate	36	32
Some college (includes community college)	33	31
College degree or more	15	18
Employment status		
Employed full-time	39%	39%
Employed part-time	19	14
Not employed	40	37
Retired	24%	20%
Race/ethnicity		
White	32%	51%
Hispanic	23%	19%
Black or African American	42%	17%
Income		
Less than \$10,000	20%	16%
\$10 to under \$20,000	22	21
\$20 to under \$30,000	18	12
\$30 to under \$40,000	7	7
\$40 to under \$50,000	5	5
\$50 to under \$75,000	2	2
\$75 to under \$100,000	1	2
\$100 or more -	1	*
Don't know/Refused	24	36