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# Community Access to Technology Program Evaluation Report—Year 3

March 2008

Study Conducted by MGS Consulting for  
the Community Access to Technology Program  
of the Bill & Melinda Gates Foundation

For more information, or to hear a presentation on these findings, contact Maureen MacCarthy, Principal Consultant for MGS Consulting, at 206.760.1051 or via email: [maureen@mgs-us.com](mailto:maureen@mgs-us.com).

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## EXECUTIVE SUMMARY

From March 2005 through June 2006, MGS Consulting conducted an evaluation of youth participation in out-of-school-time programs that use technology as a learning tool for low-income youth in Washington State. Ten organizations took part, including the Yesler Community Center, Stone Soup, the 4H, and the Washington State Boys and Girls Club Alliance (see Appendix C for a complete list). All had received grants as part of the Community Access to Technology Program (CAT), which later was transferred to the Communities Connect Network.

Overall, we surveyed 885 youth participants (ages 9-19) at 36 different program sites throughout Washington State. From this we gathered responses from a subset of 85 youth participants (referred to in this report as a “matched set”) who participated in the survey three times during the 15-month evaluation process.

In our study, we looked at three areas of potential impact that are strongly tied to success in school, work, and life. These are:

- The Developmental Assets Profile (DAP), a well-researched predictor of youths’ success in later life.
- Technical fluency,<sup>1</sup> the mastery of necessary 21<sup>st</sup> century literacy and thinking skills.
- Outlook for the future, which measures youths’ hopes and aspirations for themselves in the future.

**Our study showed that the youths’ perception of all of these—developmental assets, technical fluency, and outlook for the future—increased with youths’ participation and time spent in a program.**

## DEVELOPMENTAL ASSETS

Developmental assets are positive experiences and qualities that research has shown to be essential to healthy psychological and social development in childhood and adolescence. Examples include empowerment, constructive use of time, commitment to learning, social competence, and positive identity. The Developmental Assets Profile (DAP) was developed by Search Institute to measure youths’ developmental assets. DAP scores are linked with academic and social behavior in youth; those with low DAP scores are more likely to engage in damaging and risky behavior (such as poor academic achievement and drug and alcohol abuse), while youth with high DAP scores are more likely to achieve, be leaders, and engage in positive behavior.

### Key Findings

**Participating in tech programs increases developmental assets.** First of all, we found that youth participation in community technology programs leads to an increase in perceived

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<sup>1</sup> For the purposes of this evaluation, we use The National Research Council’s (NRC) definition of technical fluency. NRC is a part of the National Academies, which for more than 100 years have provided independent advice on issues of science, technology, and medicine that underlie many questions of national importance. According to the NRC, technical fluency focuses on the participant’s ability to understand, explain, and discuss technical tools and concepts. The transfer of technology know-how involves imparting knowledge from one to another. Within the field, the shortened name “tech fluency” is used to identify this concept.

developmental assets. Youths' perceived developmental assets increased with time spent in a program.

In addition, the number of hours a youth participated per week in a technology program was positively correlated with their DAP score. This held true for all ages, genders, and program types.

**Increased DAP score leads to a chance of other improvements.** Search Institute divides asset levels into four categories— Low, Fair, Good, and Excellent. Research has found that jumping from one category to the next is linked to dramatic increases or decreases in risky and healthy behaviors. Search Institute research shows that nationally, most youth rank in the “Fair” and “Good” asset categories, but to maximize one’s chances in life, scoring at minimum at the low end of the Excellent category (having 30 out of 40 assets) is preferred.

In our study, participation was linked with an increase in assets and progression into higher categories of assets. This means that, **after participating in youth technology programs, kids have a much greater chance of engaging in healthy behaviors and a greatly decreased risk for engaging in risky or destructive behaviors.** By tracking the gains in developmental assets in our 85 matched set participants, we discovered that youth participants had greatly reduced their chances of illicit drug use, problem alcohol use, sexual intercourse, and violence. They also had increased their chances of succeeding in school, exhibiting leadership, valuing diversity, and maintaining good health.

By the end of the year, 62% of youth participants who started in the “Low” DAP category moved up to “Fair” or “Good,” and 33% moved from “Fair” to the “Good” or “Excellent” category. These participants greatly reduced their risk of engaging in problem behaviors, such as alcohol use, violence, illicit drug use and sexual activity; and increased their likelihood of engaging in positive activities such as succeeding in school and maintaining good health.

### **Reduction in Risk of Problem Behaviors**

Moving out of the “Low” DAP category has profound implications for youth outcomes and beneficial impact for youth.<sup>2</sup> For example:

Youth who moved from the “Low” to “Fair” DAP category:

- Lowered their risk of problem alcohol use from 45% to 26%.
- Lowered their risk of engaging in violence from 62% to 38%.
- Lowered their risk of illicit drug use from 38% to 18%.

Youth who moved from the “Low” to “Good” DAP category:

- Reduced their risk of problem alcohol use from 45% to 11%.
- Reduced their risk of engaging in violence from 62% to 18%.
- Reduced their risk of illicit drug use from 38% to 6%.

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<sup>2</sup> Similar gains were seen for youth who started in the “Fair” category and moved to “Good.” See Section I of this report for more details.

## Increase in Likelihood of Positive Behaviors

Youth who moved up one or more DAP levels greatly increased their likelihood of engaging in positive behaviors in the future.

Youth who moved from the “Low” to “Fair” DAP category:

- Increased their potential for succeeding in school from 9% to 19%.
- Increased their potential for exhibiting leadership behavior from 48% to 66%.
- Increased their potential for maintaining good health from 27% to 48%.

Youth who moved from the “Low” to “Good” DAP category:

- Increased their potential for succeeding in school from 9% to 34%.
- Increased their potential for exhibiting leadership behavior 48% to 78%.
- Increased their potential for maintaining good health from 27% to 69%.

In summary, we found that developmental asset scores increased with time in youth technology programs, with dramatic implications for the probability of future dangerous and healthy behaviors. We also found that these increases were positively correlated to number of hours per week spent in a program, regardless of participant age or gender or program type. As a result of these findings, we conclude that **these community youth technology programs greatly increase the chance of the future success of the youth who participate.**

## TECHNICAL FLUENCY

Technical fluency reflects the participant’s ability to understand, explain, and discuss technical tools and concepts. It contributes to what have been called the “21<sup>st</sup> Century Skills”: Digital Age Literacy, Inventive Thinking, Effective Communication, and High Productivity. These aptitudes have been identified as critical skills needed to succeed in today’s world. (Examples include understanding how a computer processes information, describing how email is transmitted, and feeling confident in learning new software applications.) When asked about their own abilities, youth participating in these programs report that they are indeed increasing their technical fluency, leading to success in each of these four 21<sup>st</sup> Century skills sets. (For details on technical fluency, see Section II of the full report.)

### Key Findings

**Technical fluency increases with time spent in a program.** Fluency and time in program are positively correlated. This means that as youth spent more time in the program, they were increasingly likely to answer “Always” in response to questions regarding their skill and comfort level with technology.

For all participants, **males had higher tech fluency scores than females.** This difference may be due to issues of confidence rather than skill acquisition, a finding consistent with at least one other

study.<sup>3</sup> Our finding suggests that girls may need programming and support to help build confidence in their own abilities.

**High-touch<sup>4</sup> program participants report higher tech fluency scores than participants in low-touch programs.** For all participants, high-touch programs had an average tech fluency score of 2.57, while low-touch sites had an average score of 2.42. These results indicate that youth need guidance and structure to truly enhance their skills. Programs which simply offer access may indeed provide a safe and positive place for youth to congregate outside of school. While this may be valuable in and of itself, it is not the same as actively working to increase tech skills. Programs intended to strengthen the tech fluency skills of their participants should consider incorporating some aspects of high-touch programs (such as structured classes and projects and highly engaged program staff).

**Technical fluency is higher for teens than preteens.** While this result is partly expected, it may also suggest that preteens are a primary audience for these tech programs. Programs should encourage youth to begin participating in community technology programs when they are preteens, allowing them to participate for multiple years and have adequate time to grow and develop their skills.

## OUTLOOK FOR THE FUTURE

Believing you can accomplish something is the first step toward success. This positive mindset is powerful; for example, research shows that a positive attitude and belief that one will attend college is linked to actual college attendance rates. In our study, youth who participate in the technology programs believe that they will do better in school, attend college, and get a good job after they finish school. (For details, see Section III of this report.)

### Key Findings

**The longer the youth participants participated in the technology programs, the more positive their outlook on their future became.**

- Over a 15-month period, youth in the matched set became **more optimistic about their school performance**: More youth believed they would improve their study skills (60% in the first survey vs. 70% in the third) and graduate high school (72% vs. 76%).
- We saw the following changes regarding **job outlook and readiness**:
  - Seventy-seven percent of youth new to the program reported that they would get a good job, compared with 90% of kids who had been in a program for more than three years.

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<sup>3</sup> This finding is consistent with a study of tech fluency skills at Southwestern University: “The American Freshman: National Norms for Fall 2000” revealed that male and female college students have identical rates of computer use, but the men are twice as likely as the women to have a high opinion of their skills...The majority of males see themselves as having a higher fluency...than do females.” From “How Fluent with Information Technology Are Our Students?” by Sharon Fass McEuen, 2001, page 11. In *EDUCAUSE Quarterly*. <http://www.educause.edu/ir/library/pdf/EQM0140.pdf>

<sup>4</sup> High-touch programs are more structured and tend to offer guided projects and classes. Youth are encouraged to learn, create, and work with leaders and their peers. Low-touch programs tend to be less structured and offer more lab time rather than classes.

After time in a program, more youth said they believed they would get a good job when they were done with school (88% vs. 83%).

- More youth in high-touch programs thought participating would help them go to college (70% vs. 60%). However, more youth in low-touch programs thought participation would help them in school (67% vs. 62%). This implies that high-touch programs focus on preparing for the future while low-touch programs focus on succeeding today.
- **Preteens have a more positive outlook than teens.** As youth age, more is needed programmatically that will help them continue to see their potential. If teens can maintain the positive outlook they had as preteens, perhaps they will be more likely to continue to attend these programs and maintain high expectations for their education and careers.
- In our matched sample, **girls showed the greatest gain in outlook.** This speaks to the additional confidence that is linked to technical fluency.
- **Unique skills are acquired in the first year.** Youth were asked if the skills they were learning by participating in these programs were skills that could or could not be learned elsewhere. Youth reported that they acquired the most skills that cannot be learned elsewhere in the first year of participation. This indicates that while the learning curve for new skills is steep during the first year of participation, that curve levels out quickly. Programs should be encouraged to offer more challenging courses and programs for teens who have been in their program for several years. By teaching skills that can't be acquired elsewhere, the programs have a better chance of keeping youth challenged and engaged.

## CHARACTERISTICS OF EFFECTIVE PROGRAMS

Several individual sites had higher than average scores for at least one of our main indicators (developmental assets, technical fluency, or outlook for the future). Key factors to the success of these sites include:

- **Highly involved, consistent staff.** Having staff members who are trained, reliable, and consistent can have a major impact on a program. Sites with higher than average scores had reliable staff who were dedicated to the program and the participating youth.
- **Parent involvement.** Sites with higher scores reported higher levels of parental involvement.
- **Physical space and location.** Sites with higher than average scores tend to be located in permanent locations that are easily accessible by youth and offer an inviting, comfortable atmosphere.
- **Going beyond technology for technology's sake.** Sites with higher than average scores offer programs and projects which connect technology to the everyday (and academic) lives of their participants. This connection makes technology feel relevant to the participants and allows them to see practical and applicable uses for the skills they are learning.

**Integrated soft skills.** In addition to technical skills, many sites with higher than average scores offered soft skills as well, such as job interview skills and conflict management. These soft skills complement the technology skills and further equip the participating youth for higher education or employment.

# INTRODUCTION

## THE COMMUNITY ACCESS TO TECHNOLOGY (CAT) PROGRAM

In 1999, the Bill & Melinda Gates Foundation started the Community Access to Technology Program to help Washington nonprofit organizations provide local communities greater access to digital technology. The focus of the CAT program was on supporting organizations that help at-risk youth, persons with disabilities, homeless persons, immigrant populations, Native Americans, and rural communities to use technology to make positive changes in their lives and in their communities. From 1999 through 2005, the foundation granted \$14 million to 330 organizations and sites in Washington State, resulting in services being provided to over 78,400 people.

In 2005, the Community Access to Technology Program was transferred to the Center to Bridge the Digital Divide program (CBDD) of Washington State University and was renamed the Communities Connect Network to emphasize the efforts to bring together community technology interests from across the state<sup>5</sup>. While continuing to provide grants and support to nonprofit technology providers, the CBDD has transformed the program from a private grant-making initiative to a self-sustaining network for community-based technology in Washington. Today, the Communities Connect Network is a statewide coalition of public and private organizations working to ensure that Washington State is a leader in digital inclusion technology opportunities for all by helping to increase the use of technology by nonprofit organizations to help Washington's under-served, under-represented, and disconnected populations.

## THE MULTI-YEAR EVALUATION OF THE CAT PROGRAM

Starting in 2003, MGS Consulting conducted a three-year evaluation of the CAT program. For each year, the goal of the evaluation was to quantify and gain a better understanding of the community and societal impact that the CAT grant portfolio has had on its strategic target communities.

Highlights from the first two years of the evaluation showed the following:<sup>6</sup>

- The goals of most clients of community technology programs involve increasing academic achievement and literacy, or improving their economic opportunities and position.
- Ninety-three percent of grantees continue to operate their projects successfully and have maintained CAT project staff positions.
- One-fourth of grantees offer more programs than originally expected and 31% serve more people than projected.

The third and final year of study is the focus of this report: an evaluation of the impact of the use of technology as a learning tool for low-income youth in Washington State.

## ABOUT THIS REPORT

This report is organized around the three indicators we used to measure the impact of technology programs on youths' perceived success:

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<sup>5</sup> See [www.communitiesconnect.org](http://www.communitiesconnect.org) for more information.

<sup>6</sup> For more information on evaluations for previous years, see Appendix B of this report or visit [http://www.gatesfoundation.org/UnitedStates/PacificNorthwest/Evaluations/CAT\\_Evaluation.htm](http://www.gatesfoundation.org/UnitedStates/PacificNorthwest/Evaluations/CAT_Evaluation.htm).

- **Section I (“Developmental Assets”)** examines youths’ developmental assets and analyzes how participating in a technology program affects these assets, as measured by their Developmental Assets Profile (DAP) score. We also analyze how changes in DAP score may affect the likelihood of future positive or negative behavior.
- **Section II (“Technical Fluency”)** looks at the relationship between the youths’ confidence in their technical skills and their participation in tech programs.
- **Section III (“Outlook for the Future”)** shows how tech programs affect youths’ expectations for future success in school and jobs.

To see the key findings of our evaluation at a glance, see the **Executive Summary**. To understand the concepts and terms we use in our analysis, see **Appendix A (“Key Terms and Definitions”)**. To learn more about the study’s history or design, see **Appendix B (“CAT Study History”)** and **Appendix C (“Study Design and Methodology”)**. Other appendices contain the full text of survey and interview questions as well as raw data.

# I. DEVELOPMENTAL ASSETS

## SUMMARY

The Developmental Assets Profile (DAP) is widely used to predict the future potential of youth, specifically whether they will engage in positive or risky behaviors. The units for quantifying these predictors are called “assets.” Examples include “Caring school climate,” “Positive family communication,” and “Reading for pleasure.” The more assets a youth has, the higher her DAP score, and the more likely she is to succeed in life.

Developmental assets are “developmental vitamins”—positive experiences and qualities identified by the Search Institute that are essential to healthy psychological and social development in childhood and adolescence. These assets have the power to influence young people’s developmental trajectories, protect them from a range of negative outcomes, and help them become more productive, caring, and responsible adults.<sup>7</sup>

For the purposes of comparison and analysis, DAP scores are divided into four groups: “Low,” “Fair,” “Good,” and “Excellent.” We used the DAP instrument over the course of a year to evaluate the impact of youth technology programs. **Overall, we found that youth participation in community technology programs leads to an increase in developmental assets.**

## Key Findings

### The most significant findings of this study:

- **DAP scores for participants tended to increase over time.** For all participants, DAP scores peaked for youth who participated in the program for 1-3 years. For the matched set, however, DAP scores continued to rise the longer the youth participated in the program.
- For youth in the matched set who had participated 0-7 days when they took the first survey, DAP scores increased over time for all participants—preteens, teens, females, males, those in high-touch programs, and those in low-touch programs. This finding indicates that **for those who were new to the technology programs, participation had a positive affect on DAP scores, regardless of gender, age, or program type.**

### Other findings:

- The average DAP score for the participants was 43, which falls into the “Good” category. This is slightly higher than the national average, which is in the “Fair” category.
- **Youth’s developmental assets increased with time spent and participation in youth technology programs.** Regardless of how long the youth had been in the program, the number of hours they participated per week was positively correlated with their asset score.

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<sup>7</sup> From *Developmental Assets Profile Preliminary Users Manual*, 2004, page 2.

- In our sample matched set , 62% of youth who tested in the “Low” category had moved to at least the “Fair” category by the end of the year, 33% who started in “Fair” moved to at least the “Good” category, and 10% moved from “Good” to “Excellent.”
- **Moving to a higher DAP category has a large impact on the chance of future positive and negative behavior.** For those who moved from “Low” to Fair”:
  - Their risk of developing problem alcohol use decreased from 45% to 26%.
  - Their risk of engaging in violence decreased from 62% to 38%.
  - Their likelihood of succeeding in school increased from 9% to 19%.
  - Their likelihood of maintaining good health increased from 27% to 48%.
- For those who jumped two DAP categories, from “Low” to “Good””:
  - Their risk of developing problem alcohol use decreased from 45% to 11%.
  - Their risk of engaging in violence decreased from 62% to 18%.
  - Their likelihood of succeeding in school increased from 9% to 34%.
  - Their likelihood of maintaining good health increased from 27% to 69%.
- Although time in program increased assets, **the first year of participation has the greatest impact for all youth** regardless of gender, age, or program type.
- While these programs attract youth with higher-than-average asset levels, they have tremendous potential for impacting youth with low assets, particularly **females** and **preteens**.
  - Females increase their asset scores over time spent in the programs, and females who are new to the program have the highest increase of asset scores of all demographic groups over time.
  - Preteens increase their assets scores over time.
- Marketing and outreach is needed to find, attract, and retain more females and youth with lower assets into the programs.

## INDICATORS OF DEVELOPMENTAL ASSETS

The Developmental Assets Profile (DAP) was developed by Search Institute<sup>8</sup> to quantify the experiences and qualities associated with raising successful young people. The number of assets present in a youth’s life comprises his or her Developmental Asset Score. Scores are linked with academic and social behavior: Youth with low asset levels are more likely to engage in damaging and risky behavior (such as poor academic achievement and drug and alcohol abuse), while youth with high asset levels are more likely to be leaders, achieve, and engage in positive behavior.

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<sup>8</sup> Search Institute is an independent nonprofit organization whose mission is to provide leadership, knowledge, and resources to promote healthy children, youth, and communities. See [www.search-institute.org](http://www.search-institute.org) for more information.

The DAP survey measures a total of 40 developmental assets—20 external indicators and 20 internal indicators.<sup>9</sup>

*External* asset scores measure the following<sup>10</sup>:

- **Support**—Young people need to experience support, care, and love from their families, neighbors, and many others. They need organizations and institutions that provide positive, supportive environments.
- **Empowerment**—Young people need to be valued by their community and have opportunities to contribute to others. For this to occur, they must be safe and feel secure.
- **Boundaries and expectations**—Young people need to know what is expected of them and whether activities and behaviors are “in bounds” or “out of bounds.”
- **Constructive use of time**—Young people need constructive, enriching opportunities for growth through creative activities and youth programs.

*Internal* asset scores focus on the following indicators<sup>3</sup>:

- **Commitment to learning**—Young people need to develop a lifelong commitment to education and learning.
- **Positive values**—Young people need to develop strong values that guide their choices.
- **Social competencies**—Young people need skills and competencies that equip them to make positive choices, to build relationships, and to succeed in life.
- **Positive identity**—Young people need a strong sense of their own power, purpose, worth, and promise.

In our study, we added the external and internal assets scores to create each participant’s total asset score, which is referred to throughout this report as the “DAP score” and is tracked over time for the matched set.

The DAP was developed to complement the Search Institute’s Attitudes and Behavior (A&B) survey. To validate our DAP findings, we will compare them to patterns seen in the A&B survey, which has been reliably used for over a decade and has involved millions of youth.<sup>11</sup>

Search Institute divides asset levels into the following four categories<sup>12</sup>:

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<sup>9</sup> From the Search Institute website, “The 40 Developmental Assets for Adolescents,” <http://www.search-institute.org/assets/>

<sup>10</sup> From the Search Institute website, “Asset Categories,” <http://www.search-institute.org/assets/assetcategories.html>

<sup>11</sup> For details on the Attitudes and Behaviors survey, see Appendix A of this report or the Search Institute website: <http://www.search-institute.org/surveys/ab.html>.

<sup>12</sup> *Developmental Assets Profile Preliminary Users Manual*, January 2004.

TABLE 1: ASSET LEVEL CATEGORIES

CATEGORY	DAP SCORE
Low	0-29
Fair	30-40
Good	41-50
Excellent	51-60

Search Institute research has demonstrated that, as DAP scores increase, the chance that youth will participate in risky behavior decreases and their likelihood for participating in positive behavior increases. For example, youth with “Fair” scores have an 18% chance of illegal drug use, compared with a 6% chance for youth in the “Good” category. Moving up only one category has a significant affect on the likelihood of future youth behavior.

## RESULTS: DAP SCORE CATEGORIES AND AVERAGES

### Average DAP Scores

When we analyzed the results of this survey, it became apparent that these tech programs tend to attract youth with higher-than-average DAP scores. All participants in our study had an average DAP score of 43.19, with a median score of 44. For the matched set, the average DAP score was 41.15 with a median score of 41.67. In contrast, the average reported by Search Institute is between 30 and 40 (the equivalent of 19 assets).

Both the A&B survey data and our results indicate that the majority of youth fall into the “Fair” and “Good” categories (74% for A&B, 71% for our research). Differences, however, are seen in the “Low” and “Excellent” groups. In the A&B survey, 17% of youth were in the “Low” group, while only 6% of youth in our survey fell into that category. Conversely, 8% of youth in the A&B survey were in the “Excellent” category, compared with 23% of youth in our study. The following table juxtaposes the Search Institute findings for all youth with the results of this evaluation:

TABLE 2: DAP CATEGORY—A&B SURVEY VS. OUR PARTICIPANTS

DAP CATEGORY	A&B SURVEY <sup>13</sup>	OUR SURVEY
Low	17%	6%
Fair	42%	28 %
Good	32%	43 %
Excellent	8%	23 %

<sup>13</sup> Average scores from the Search Institute website, <http://www.search-institute.org/research/assets/assetlevels.html> (accessed August 17, 2006).

This finding holds significance because in our study, youth with low DAP scores experienced an immediate and steady increase in their scores regardless of demographic or programmatic differences. In order to have an impact on youth who are truly at risk for participating in dangerous behavior, programs should consider adjusting their marketing to engage (and programming to retain) youth with low DAP scores.

### Increases in DAP Score Category

In the matched set, large percentages of youth moved from a lower DAP category to a higher one. In the first survey, 10% of the youth in the matched set were in the “Low” category, 29% were in the “Fair” category, 47% were in the “Good” category, and “14% were in the “Excellent” category<sup>14</sup>. In the third survey, many youth who began in the three lower asset categories reported moving to a higher category. As the table below illustrates, **the youth in the lowest DAP category (“Low”) showed the most improvement.**

TABLE 3: PERCENTAGE OF YOUTH MOVING TO HIGHER ASSET CATEGORY

BEGINNING ASSET CATEGORY (1 <sup>ST</sup> SURVEY)	MOVED TO HIGHER CATEGORY (3 <sup>RD</sup> SURVEY)
<b>Low</b>	62%
<b>Fair</b>	33%
<b>Good</b>	10%

The fact that many youth move to higher asset categories is highly significant. Having more developmental assets decreases the chance of youth making many harmful or risky choices. Of the 85 youth in the matched set, 62% of those who started in the “Low” asset category moved to a higher group by the time they completed the third survey.

As the following table adapted from the Search Institute website illustrates, youth with the most assets are least likely to engage in four different patterns of high-risk behavior.<sup>15</sup> For example, youth in the “Excellent” category have only a 3% chance of problem alcohol use, while youth in the “Low” asset category have a 45% chance. In our evaluation, 38% of the youth who started in the “Low” category ended in “Fair,” and 25% of the “Low” group ended in “Good.” As you can see in the following table, this movement to a higher asset group can significantly affect the likelihood of future youth behavior.

<sup>14</sup> Low: n=8; Fair: n=24; Good: n=39; Excellent: n=13.

<sup>15</sup> From <http://www.search-institute.org/research/assets/assetpower.html> (accessed October 3, 2006).

TABLE 4: LIKELIHOOD OF FUTURE NEGATIVE BEHAVIOR BY DAP CATEGORY

LIKELIHOOD OF BEHAVIOR ASSOCIATED WITH DAP CATEGORY				
BEHAVIOR	LOW	FAIR	GOOD	EXCELLENT
<b>Problem Alcohol Use</b>	45%	26%	11%	3%
<b>Violence</b>	62%	38%	18%	6%
<b>Illicit Drug Use</b>	38%	18%	6%	1%
<b>Sexual Activity</b>	34%	23%	11%	3%

All the youth who started in the “Low” category had a 45% change of problem alcohol use when they began participating in a tech program. Those who moved into the “Fair” category cut their chance of problem alcohol use almost in half, to 26%. And those who ended in the “Good” category decreased their likelihood of problem alcohol use by 34%! These changes are significant, and clearly illustrate the positive impact these programs are having on the participating youth in a relatively short period of time.

Increasing one’s asset category also impacts the likelihood of *positive* behavior. As seen below, youth in the “Low” category have only a 48% chance of exhibiting leadership, while youth in the “Excellent” category have an 87% chance:

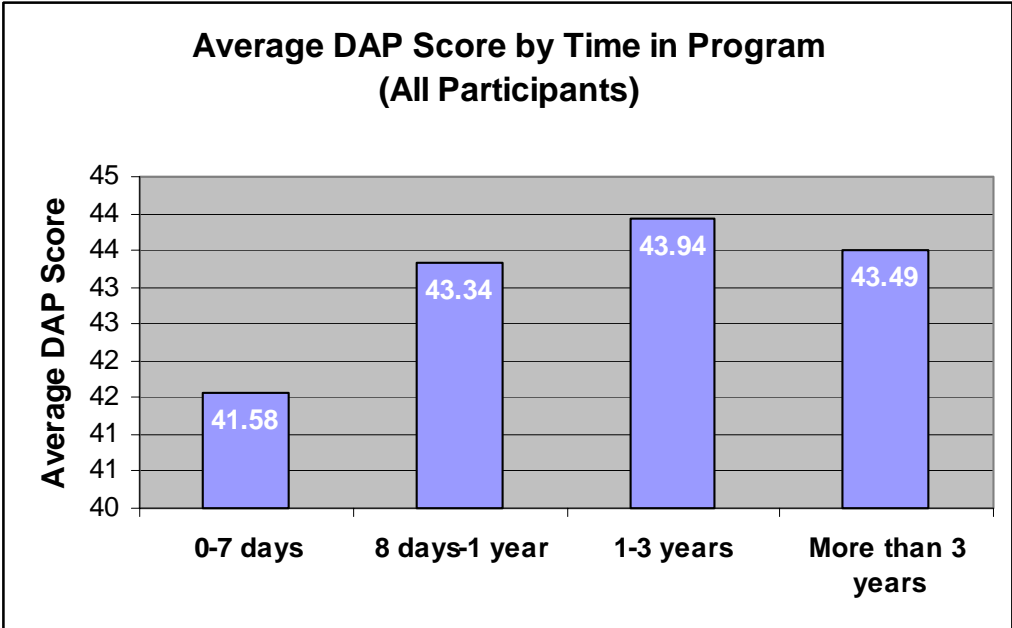
TABLE 5: LIKELIHOOD OF FUTURE POSITIVE BEHAVIOR BY DAP CATEGORY

LIKELIHOOD OF BEHAVIOR ASSOCIATED WITH DAP CATEGORY				
BEHAVIOR	LOW	FAIR	GOOD	EXCELLENT
<b>Exhibits Leadership</b>	48%	66%	78%	87%
<b>Maintains Good Health</b>	27%	48%	69%	88%
<b>Values Diversity</b>	39%	60%	76%	89%
<b>Succeeds in School</b>	9%	19%	34%	54%

## EFFECT OF TIME IN PROGRAM AND FREQUENCY OF ATTENDANCE

Given that many participants jumped to a higher DAP level, we weren't surprised to find that overall DAP scores rose over time for all youth, except those who had been in the program for more than three years. When all the participants were categorized by time in program, **youth who were in the program for 1-3 years had the highest DAP score, 43.94.**<sup>16</sup> This is illustrated in the chart below:

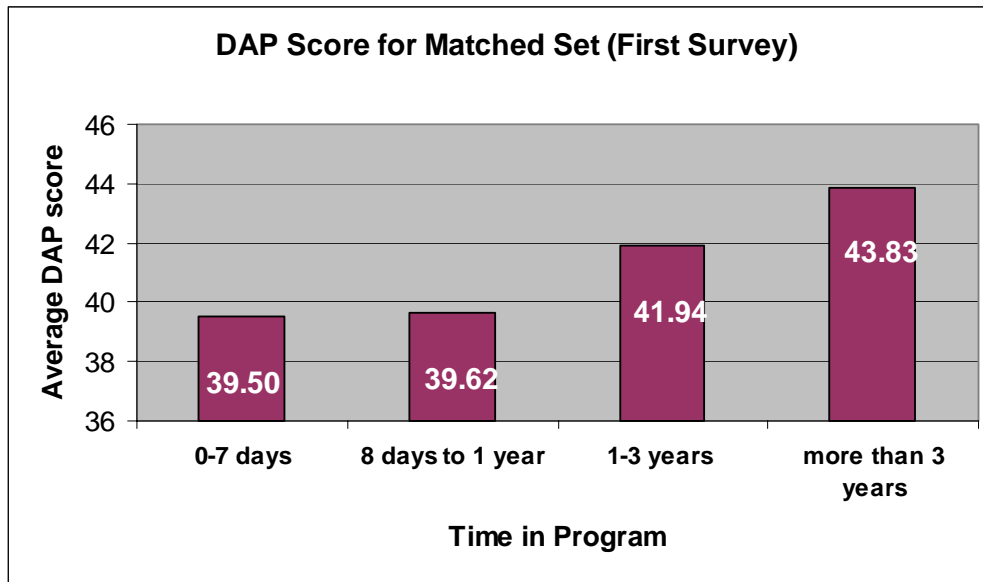
CHART 8: DAP SCORE BY TIME IN PROGRAM (ALL PARTICIPANTS)



We divided **matched set** participants into categories based on the amount of time they had been participating in the program when they took the first survey. **The longer a youth had been participating in the program when they took the first survey, the higher their DAP score.** This pattern is shown in the following chart:

<sup>16</sup> DAP scores and Time in Program are correlated at the 0.01 level.

CHART 9: DAP SCORE BY TIME IN PROGRAM (MATCHED SET)



For youth in the matched set who had participated 0-7 days when they took the first survey, **DAP score increased over time for all participants—preteens, teens, females, males, those in high-touch programs, and those in low-touch programs.** This indicates that for those who were new to the technology programs, **participation had a positive affect on DAP scores, regardless of gender, age, or program type.**

### All Participants –Time in Program

To further analyze the DAP scores, we divided all the participants into the following “Time in Program” categories:

- 0-7 days
- 8 days to 1 year
- 1 to 3 years
- More than 3 years

To examine the effects of demographic variables on DAP score, we compared the demographics of each “Time in Program” category with the demographics for all participants in our survey:

TABLE 6: DEMOGRAPHIC BREAKDOWN BY TIME IN PROGRAM (ALL PARTICIPANTS)

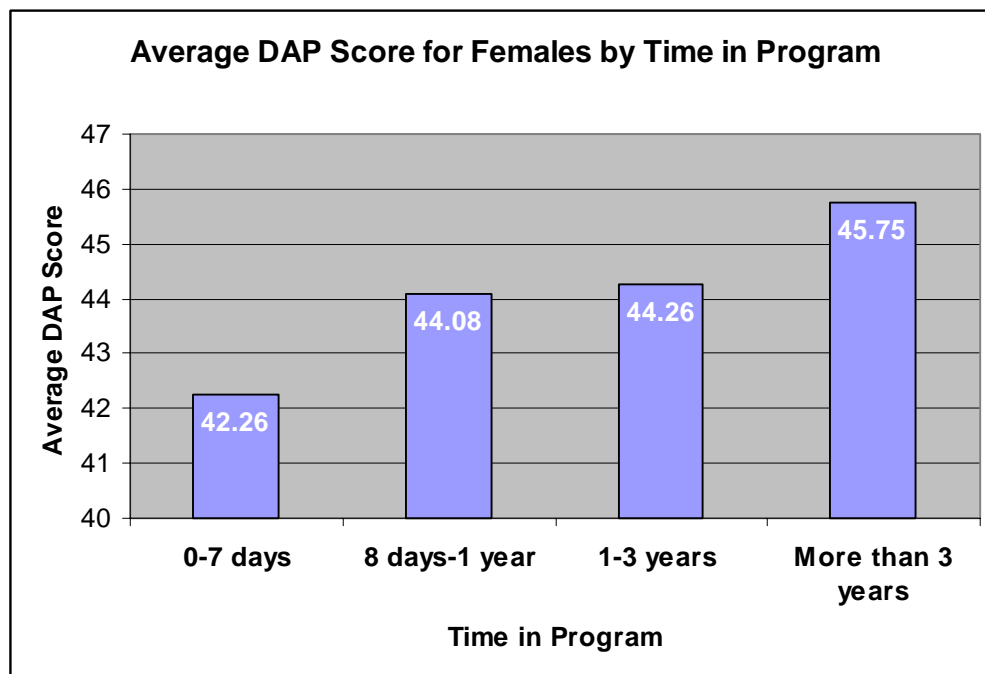
TIME IN PROGRAM	N	MALE	FEMALE	TEEN	PRETEEN	HIGH-TOUCH	LOW-TOUCH
0-7 days	169	64%	36%	58%	42%	54%	46%
8 days-1 year	181	64%	36%	65%	36%	58%	42%

TIME IN PROGRAM	N	MALE	FEMALE	TEEN	PRETEEN	HIGH-TOUCH	LOW-TOUCH
1–3 years	345	60%	40%	56%	44%	60%	40%
More than 3 years	99	60%	40%	47%	53%	47%	53%
<b>All participants</b>	885	61%	39%	58%	42%	56%	44%

By comparing these statistics, you can see that three of the “Time in Program” categories are accurate representations of the entire group. For example, 61% of all participants are male, and 64% of the youth in the “0-7 days” category is male. The only exception is youth who had been in the program longer than three years.

For all participants, youth who participated in the programs for 1-3 years had the highest DAP score, 43.94.<sup>17</sup> When we broke down results by “Time in Program,” this pattern remained true for all subsets (male, teen, preteen, high-touch, and low-touch) except females. For **females, DAP scores continued to rise the longer they participated in the program**, as seen in the chart below.

CHART 10: AVERAGE DAP SCORE BY TIME IN PROGRAM (FEMALES)



<sup>17</sup> DAP scores and Time in Program are correlated at the 0.01 level.

In addition, **females experienced the largest increase in DAP score based on time in program.** DAP scores for females who had participated in the program for more than three years was 3.49 points higher than for females who had participated for 0-7 days, as seen below.

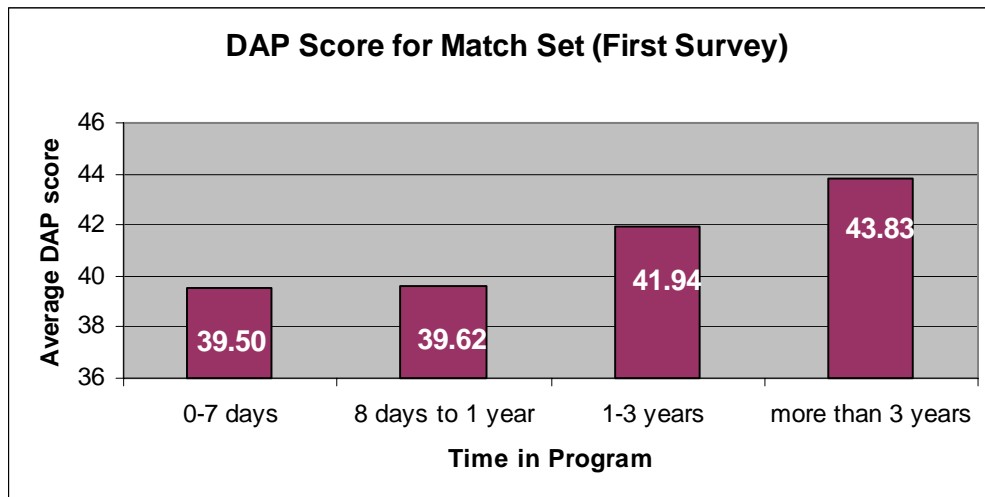
TABLE 7: DAP SCORES: EFFECT OF DEMOGRAPHIC VARIABLES BY TIME IN PROGRAM (ALL PARTICIPANTS)

VARIABLE	TIME IN PROGRAM		CHANGE IN DAP SCORE
	0-7 DAYS	MORE THAN 3 YEAR	
Teen	40.71	42.35	+1.63
Preteen	42.77	44.49	+1.72
Female	42.26	45.75	+3.49
Male	41.19	41.97	+0.77
High-Touch	41.27	43.70	+2.42
Low-Touch	41.95	43.32	+1.37

### Matched Set—Time in Program

The matched set participants were categorized into “Time in Program” categories based on the amount of time they had been participating in the program when they took the *first* survey. We found that **the longer youth had been participating in the program when they took the first survey, the higher their DAP Score.** This pattern is shown in the following chart:

CHART 11: DAP SCORE FOR MATCHED SET



This pattern led us to hypothesize that **if these programs are having a positive effect on the participating youth, the largest increase in DAP scores should be seen for youth who were new to the program** (those participating for 0-7 days).

To investigate the effect of other variables on the matched set, we compared the demographics of each group with the overall demographics for the entire group. The following table compares the percentage of each subcategory for the “Time in Program” groups with all participants.

TABLE 8: DEMOGRAPHIC BREAKDOWN BY TIME IN PROGRAM (MATCHED SET)

TIME IN PROGRAM	N	MALE	FEMALE	TEEN	PRETEEN	HIGH-TOUCH	LOW-TOUCH
0-7 days	8	25%	75%	75%	25%	87%	13%
8 days–1 year	21	76%	24%	91%	9%	72%	28%
1–3 years	50	54%	46%	72%	28%	74%	26%
More than 3 years	6	34%	66%	100%	0%	100%	0%
<b>All participants (Matched set)</b>		55%	45%	79%	21%	77%	23%

Here we see differences. While there are more males than females in the matched set, the “Time in Program” categories *0-7 days* and *More than 3 years* both have a higher percentage of females (75% and 66%). Also, *8 days-1 year* and *More than 3 years* have higher percentages of teens (91% and 100%) than in the matched set. Finally, *0-7 days* and *More than 3 years* have an above-average percentage of participants in high-touch programs (87% and 100%). These contrasts suggest that some of the differences we explore below for the matched set may be due to demographic differences and not just the effect of participation in the tech programs.

### Time in Program: 0-7 Days, Matched Set

Youth in the matched set who indicated that they were new to the program (0–7 days) had an average DAP score of 39.5 when they took the first survey. When they took the third survey, their average DAP score rose by 4 points to 43.5. **This increase moved the average DAP score for this group from “Fair” to “Good.”** As noted above, this group is composed largely of teens, females, and youth in high-touch programs (only one was in a low-touch program). When we look at these eight youth closely, we see that six out of eight had an increase in their DAP score. Three moved up to a new DAP category, and two were 1 point away from a new category when they completed the third survey.

The following table illustrates the change in DAP score from the first to the third survey for the matched set participants. Youth in the “0-7 days” category experienced the largest increase in DAP scores:

TABLE 9: DAP SCORES BY TIME IN PROGRAM (MATCHED SET)

TIME IN PROGRAM	FIRST SURVEY	SECOND SURVEY	THIRD SURVEY	CHANGE IN DAP SCORE
<b>0–7 days</b>	39.5	44.5	43.5	4.00
<b>8 days–1 year</b>	39.62	37.00	38.90	-0.71
<b>1–3 years</b>	41.94	43.00	40.7	-1.24
<b>More than 3 years</b>	43.83	45.17	38.67	-5.17

For the first group, those who had participated 0-7 days when they took the first survey, **DAP scores increased over time for all participants**—preteens, teens, females, males, those in high-touch programs, and those in low-touch programs. Table 11 breaks down this group demographically. Again, **females in this subgroup have the highest increase in DAP scores over time:**

TABLE 10: DAP SCORES BY DEMOGRAPHIC GROUP (0-7 DAYS, MATCHED SET)

	FIRST SURVEY	SECOND SURVEY	THIRD SURVEY	CHANGE IN DAP SCORE
<b>AGE</b>				
Preteen	38.00	45.00	40.00	+2.00
Teen	40.00	44.33	44.66	+4.66
<b>GENDER</b>				
Female	37.40	43.66	45.50	+8.10
Male	40.16	47.00	42.83	+2.67
<b>HIGH-/LOW-TOUCH</b>				
High-Touch	38.14	48.85	42.3	+4.16
Low-Touch (n=1)	49.00	49.00	52.00	+3.00

These results indicate that for those who were new to the technology programs, **participation has a positive affect on DAP scores, for all genders, ages, and program types.**

**Time in Program: More than 3 years, Matched Set**

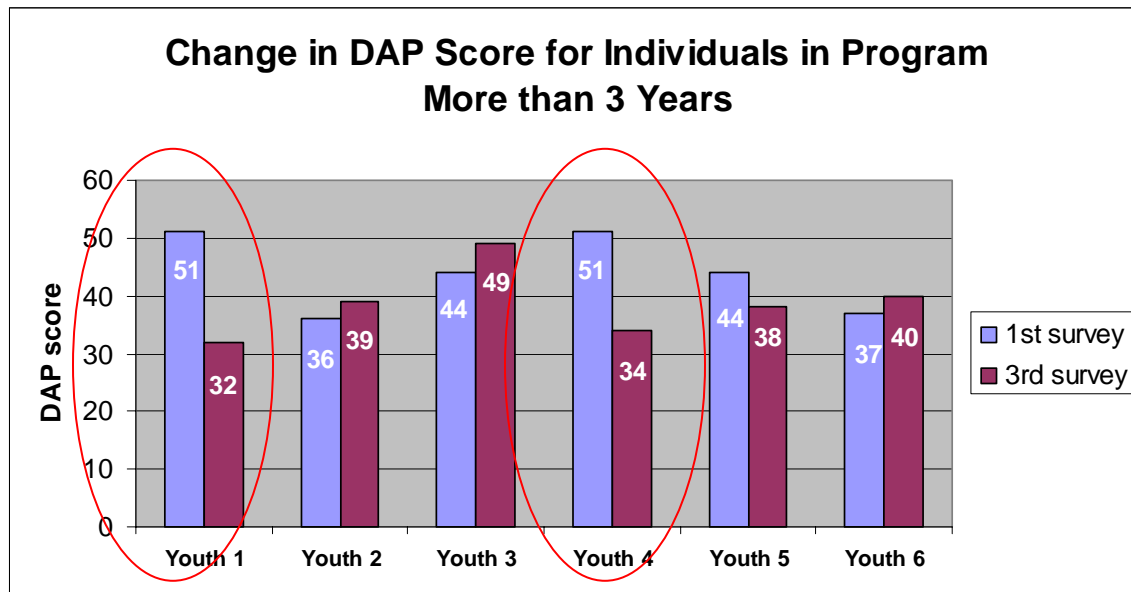
When the results for participants who have been in a program for more than three years are viewed in the aggregate, DAP scores appear to severely drop over time:

TABLE 11: DAP SCORES BY TIME IN PROGRAM (MORE THAN 3 YEARS, MATCHED SET)

TIME IN PROGRAM	FIRST SURVEY	SECOND SURVEY	THIRD SURVEY	CHANGE IN DAP SCORE
0–7 days	39.5	44.5	43.5	4.00
8 days–1 year	39.62	37.00	38.90	-0.71
1–3 years	41.94	43	40.7	-1.24
<b>More than 3 years</b>	43.83	45.17	38.67	<b>-5.17</b>

However, there are several factors at play. First, the six youth in this category are all teens, and research indicates that teens’ DAP and asset scores decrease as they age. Second, these six youth are also in high-touch programs, which tend to produce lower DAP scores than low-touch programs. When we view youth individually though, we see that DAP scores for three of these youth actually *increase*. However, these increases are overshadowed by the DAP scores of two other youth in this group (Youth 1 and 4), which dropped by nearly 20 points, as seen in the chart below:

CHART 12: CHANGE IN DAP SCORE FOR INDIVIDUAL YOUTH (MORE THAN 3 YEARS, MATCHED SET)



When these two scores are removed, the change in DAP scores from the first to the third survey becomes -1.25. This change is much more in line with the changes found in the other “Time in Program” categories, as illustrated below:

TABLE 12: DAP SCORES BY TIME IN PROGRAM (MATCHED SET), OUTLIERS REMOVED

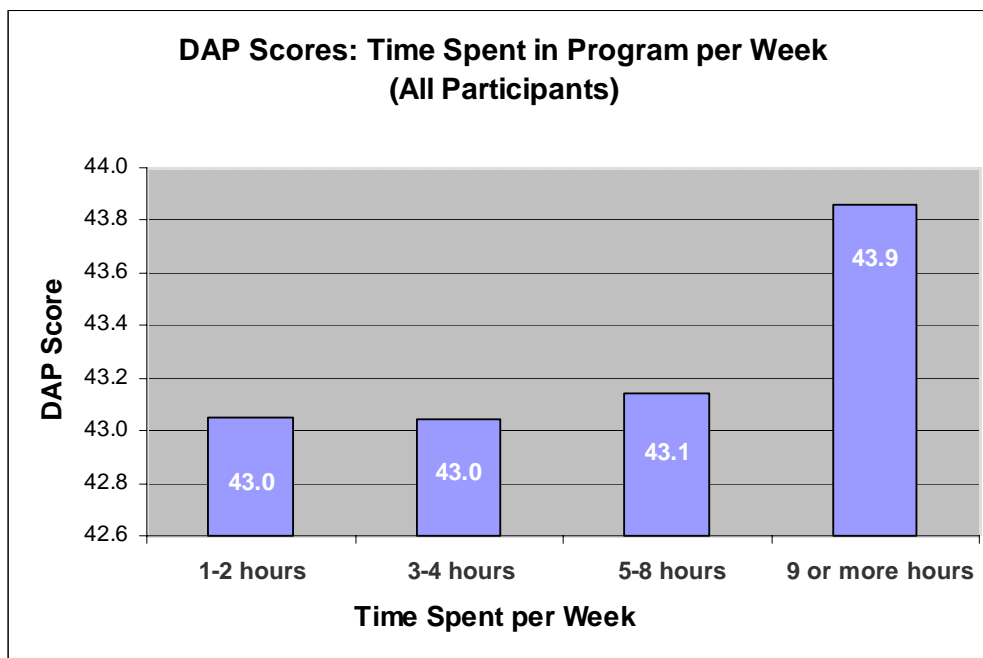
TIME IN PROGRAM	FIRST SURVEY	SECOND SURVEY	THIRD SURVEY	CHANGE IN DAP SCORE
0–7 days	39.5	44.5	43.5	4.00
8 days–1 year	39.62	37.00	38.90	-0.71
1–3 years	41.94	43	40.7	-1.24
<b>More than 3 years (without the two outliers)</b>	40.25	42.75	41.5	<b>-1.25</b>

Clearly, other factors were at play for the youth whose scores dropped by almost 20 points; however, it is difficult to decipher what those factors were. One youth is a 16-year old female; the other is a 15-year old male. They both participated in high-touch programs and the academic grades they reported remained relatively stable from survey to survey. Whatever the reason for these extreme scores, it is important to note that 50% of youth in this “Time in Program” category (*More than 3 years*) experienced an increase in their DAP scores.

#### All Participants—Hours per Week

**The more time participants spent in a program, the higher their DAP score.** Youth who spent only 1-2 hours per week in the program had an average DAP score of 43.0, while youth who spent 9 or more hours per week in the program had a DAP score of 43.9:

CHART 13: DAP SCORE BY TIME SPENT PER WEEK (ALL PARTICIPANTS)



## Implications

As DAP scores increase, the chance of risky behavior goes down and positive behavior goes up. For the youth participating in these programs, that change is becoming a reality. While many of the youth started with higher-than-average scores, they still have room for improvement. Moving up just one DAP category can have a major effect on the likelihood of future behavior. The fact that these increases happened for youth who had been participating in the program for the shortest amount of time (in the matched set) indicates that even a small amount of participation in these programs can have a significant effect. The hundreds of youth participating in these programs are now less likely to use alcohol, illegal drugs, violence, or engage in sexual activity.

## EFFECT OF GRADE LEVEL, ACADEMIC ACHIEVEMENT, AGE, AND GENDER

### DAP Scores by Grade in School

While the DAP scores seen in this evaluation are higher than those reported by Search Institute, some similar patterns were observed. For example, according to Search Institute research, assets tend to drop as youth move from 6<sup>th</sup> to 11<sup>th</sup> grade, with a slight increase in 12<sup>th</sup> grade. While the values in the following two tables should not be compared (the Search Institute data is shown as number of assets while we used DAP scores), the same pattern is seen: Scores decrease from 6<sup>th</sup> to 11<sup>th</sup> grade, and then slightly increase for youth in 12<sup>th</sup> grade.

TABLE 13: ASSET SCORES AND CATEGORIES BY ACADEMIC GRADE LEVEL

GRADE	SEARCH INSTITUTE		OUR SURVEY	
	ASSET SCORE	ASSET CATEGORY	DAP SCORE	DAP CATEGORY
6	23.0	Good	44.1	Good
7	20.2	Fair	44.0	Good
8	18.7	Fair	43.2	Good
9	17.7	Fair	42.4	Good
10	17.6	Fair	41.5	Good
11	17.6	Fair	40.4	Good
12	17.8	Fair	41.2	Good

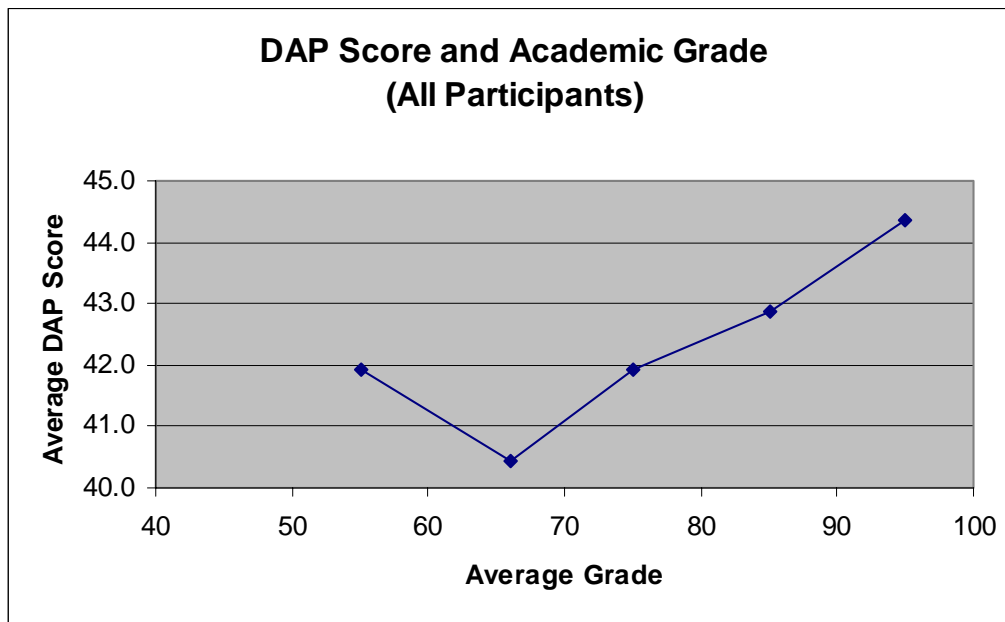
However, the youth in the our survey remain in the same category (“Good”), while youth in the Search Institute study fell from “Good” to “Fair.” This difference reflects the fact that youth in our evaluation start out with higher DAP scores than the general population, as previously noted.

These findings and similar patterns help align our outcomes with the nationally recognized work of Search Institute. This similarity helps ensure that our data is correct and our methodology is accurate.

### DAP Scores and Academic Achievement

While DAP scores drop as the youth age, they rise as the youths’ academic grades improve. DAP scores are correlated with English, Math, and Social Studies grades.<sup>18</sup> The following graph demonstrates this relationship (“Average grade” is the average of all three subjects). As you can see, youth with average grades of 95 have an average DAP score of 44.4, while youth with an average grade of 55 have an average DAP score of only 41.9:

CHART 14: CORRELATION BETWEEN DAP SCORE AND ACADEMIC ACHIEVEMENT (ALL PARTICIPANTS)



This finding indicates that if the technical programs in this study can help youth raise their DAP scores, they will likely help them raise their academic grades as well, and vice versa.

### Effect of Age (Teen vs. Preteen)

Teens reported lower DAP scores than preteens. This is expected, and reflects the findings of Search Institute’s research, which showed that as youth age, their asset scores drop, as seen in the following table:

<sup>18</sup> Correlation between asset scores and grades for English is significant at the 0.180 level, for Math at the 0.084 level, and for Social Studies at the 0.192 level.

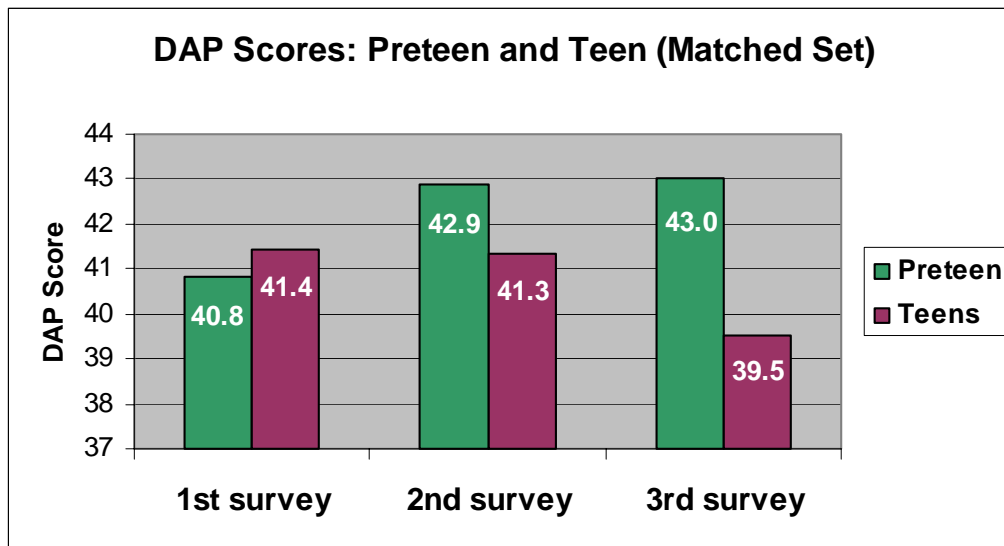
TABLE 14: ASSET SCORE BY AGE (SEARCH INSTITUTE)<sup>19</sup>

GRADE	ASSET SCORE
6	23.0
7	20.2
8	18.7
10	17.7
11	17.6
12	17.6

This pattern is reflected in our findings as well: preteens have an average DAP score of 44.4, while teens have an average DAP score of 42.3.

For the matched set, the same pattern is seen. As shown below, preteens start with lower asset scores than teens. However, preteen DAP scores rise with each survey, and end higher than teens. In contrast, teen DAP scores decrease with each survey and end lower than preteen scores.

CHART 15: DAP SCORES BY AGE (MATCHED SET)



In fact, of all the subcategories (male, female, teen, preteen, high touch, low touch), **preteens are the only group that experienced an increase in DAP score regardless of their time in a program:**

<sup>19</sup> <http://www.search-institute.org/research/assets/assetlevels.html>

TABLE 15: DAP SCORES: PRETEENS BY TIME IN PROGRAM (MATCHED SET)

TIME IN PROGRAM <sup>20</sup>	FIRST SURVEY	SECOND SURVEY	THIRD SURVEY	CHANGE IN DAP SCORE
0–7 days	38	45	40	+2.0
8 days–1 year	38.50	39.00	43.50	+5.0
1–3 years	41.57	43.14	43.36	+1.8

Again, these findings indicate that our work is accurate and in alignment with the general trends found by Search Institute. As for preteens increasing their DAP score regardless of time in program, this may be an area where further research is needed. Will DAP scores for preteens increase regardless of any interventions? Will they respond in a similar way to another type of program, other than technology-focused? Will youth who enter these programs as preteens perhaps buck the trend and continue to increase their DAP scores when they become teens? With answers to these questions, program leaders could decide whether or not it is more effective to heavily recruit and retain preteens, or to focus their efforts on teens.

#### Effect of Gender (Male vs. Female)

For all the participants, females reported higher DAP scores than males. This is consistent with the Search Institute’s findings, as seen in the table below. (Again, the values in the tables should not be compared; they are only meant to show the similar pattern of females reporting higher scores than males.)

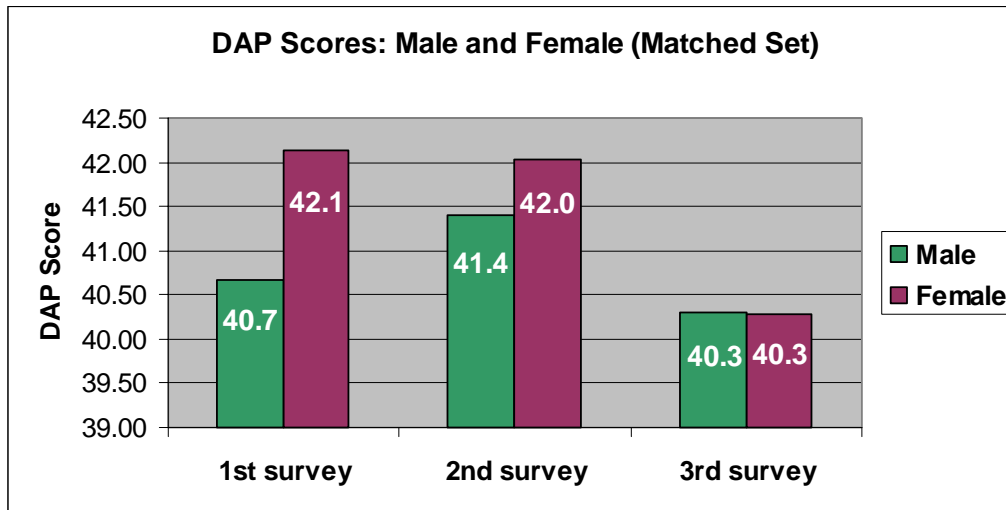
TABLE 16: DAP SCORES BY GENDER

	SEARCH INSTITUTE	OUR EVALUATION
GENDER	ASSET SCORE	DAP SCORE
Female	19.9	44.0
Male	17.2	42.7

For the matched set, females continue to report higher DAP scores than males. However, for both genders, DAP scores fall with each survey, and the end with the same score of 40.3:

<sup>20</sup> There were no preteens in the matched set who had participated for more than three years at the time they took the first survey.

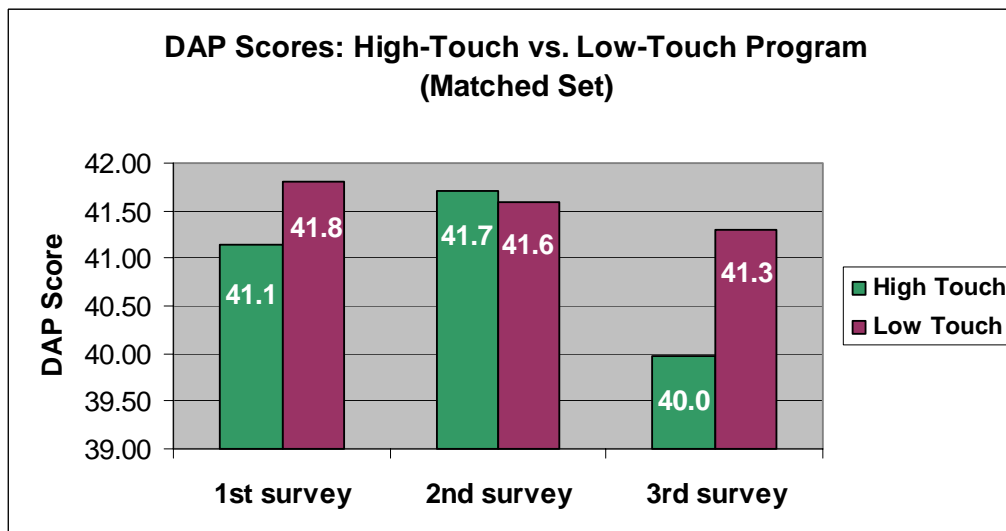
CHART 16: DAP SCORES BY GENDER (MATCHED SET)



### Effect of Program Type (High-Touch vs. Low-Touch)

For all participants, those in low-touch programs reported higher DAP scores than youth in high-touch programs. With the matched set, we saw a similar pattern. Low-touch participants reported higher DAP scores in the first and third survey, while high-touch participants reported higher scores by an extremely small margin (0.1) in the second survey:

CHART 17: DAP SCORES BY PROGRAM TYPE (MATCHED SET)



### Implications

Overall, DAP scores decreased as youth aged, and preteens had higher scores than teens. Females had higher scores than males, and low-touch participants reported higher DAP scores than youth in high-touch programs. All these findings align with the national data gathered by Search Institute.

These findings also suggest that different participants have different experiences in the individual programs, with females and preteens showing the most improvement. DAP scores for females increased the longer they participated in a program, and scores for preteens increased regardless of how long they were in a program. Interestingly, the two groups who seemed to benefit the most represent the minority of all participants (39% females vs. 61% males; 43% preteens vs. 58% teens). **Perhaps programs should revise their marketing to target more females and preteens**, since it is with these two groups that they seem to have the most impact.

Or perhaps the current curriculum and/or organization of the technical program is not appropriate. The majority of participants are male and teens, yet these are the precise groups reporting the least improvement in DAP scores. Program leaders should look for any disconnects between who they are serving and how the program functions (including curriculum, leaders, timing of programs, etc). With some marketing and program adjustments, perhaps a more balanced group of males and females, teens and preteens will participate and show gains in DAP scores.

## II. TECHNICAL FLUENCY

### SUMMARY

In order for youth to be successful after high school, they need to be fully prepared for college or employment after graduation. Sadly, that is not the situation for many youth in this county. The statistics for current high school graduation rates are unsettling<sup>21</sup>:

- Nationwide, nearly one in three 9<sup>th</sup> graders fails to graduate from high school.
- The high school graduation rate for African-American students in 2003 was just 55% and the rate for Hispanic students was 53%.
- The dropout rate for low-income students is twice that for middle-income students and five times higher than the rate for those from high-income families.
- Three-fourths (75%) of state prison inmates and 59% of federal inmates are high school dropouts.

The national graduation rate is 70%. However, only one-third of those graduates are ready for college or employment. Again, minority and low-income youth fare the worst: In 2002, only 23% of African-American students graduated college-ready; for Hispanic students, the figure was only 20%.

What can be done to change this situation? Students must graduate high school with the skills and digital literacy needed to succeed in today's world. Another name for this new required skill set is "21<sup>st</sup> Century Skills." These include:

- **Digital-Age literacy.** This includes basic, scientific, economic, technical, and visual skills. By participating in technology programs, youth are exposed to and learn about all these levels of literacy. Through creative programming and projects, these subjects are often woven together to allow students to understand not only each topic alone, but also how they intersect.<sup>22</sup>
- **Inventive thinking.** As youth gain technical fluency and confidence, they are more and more able to manage complex programs and processes, as well as create their own imaginative and independent works. Youth with a solid base of technical understanding are more willing to take risks by trying to learn new aspects of hardware and software.<sup>23</sup>
- **Effective communication.** At many of the technical programs in our evaluation, communication is key. Some programs ask the students what they want to learn and require them to be thoughtful and clear in their answers. In addition, technical programs with open labs often involve youth working or playing together to figure out a challenging problem or solve a game or puzzle.<sup>24</sup>

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<sup>21</sup> Statistics and quote from *All Students College-Ready: Findings from the Foundation's Education Work 2000-2006*, Bill & Melinda Gates Foundation.

<sup>22</sup> From <http://www.ncrel.org/engage/skills/agelit.htm>.

<sup>23</sup> From <http://www.ncrel.org/engage/skills/invent.htm>.

<sup>24</sup> From <http://www.ncrel.org/engage/skills/effcomm.htm>.

- **High productivity.** The Computer Clubhouse in Tacoma, Washington, is an excellent example of how technology programs encourage high productivity. Youth at the Clubhouse create movies, music, films, and more. Their products are finished and professional, and every year there is a showcase event to display their work. Participants in this program are encouraged to be both highly creative and productive.<sup>25</sup>

Having a high level of tech fluency becomes increasingly important as our society continues to become “...more and more dependent not just on technology in general, but on information technology (IT) in particular. As technology advances, so too must its users adapt to harness the skills necessary to employ information technology to their advantage.”<sup>26</sup>

## Key Findings

We found that the technical programs in our evaluation helped to improve the technical fluency of participants and therefore play a vital role in teaching youth the four components of 21<sup>st</sup> Century Skills. This is vital because many of these youth are the ones who don’t fare well in graduation statistics: low-income and minorities. By participating in these programs, the youth hone their skills and thereby increase their chances of graduating from high school and leading a successful life.

- **Technical fluency increases with time spent in the program.** Tech fluency and time in program are positively correlated. The more time youth spent in a program, the more often they answered “Always” when asked if they had specific skills (such as being able to distinguish hardware and software problems).
- Based on the impact of programs on specific populations, the results of our study suggest the following potential **strategic programming opportunities**:
  - **Females may need more support.** Female youth report lower skill levels than males. However, this difference may indicate a difference in *confidence* rather than actual skills acquisition. Females need extra programming and support to help build their confidence in their own abilities.
  - **High-touch programs succeed because of their structure.** Youth in high-touch programs succeed in part due to the programs’ structure (such as performance expectations, guided projects, and classes). Youth in low-touch programs need more than just access. Low-touch programs tend to offer more open lab time and provide less structure.
  - **Programs should target less-fluent preteens.** Technical fluency is higher for teens than preteens. While this result is partly expected because teens are older and more experienced with technology, it may also suggest that preteens are a primary audience for these programs. Programs should consider encouraging youth to join when they are preteens, allowing them to participate for multiple years and have adequate time to grow and develop their skills.

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<sup>25</sup> From <http://www.ncrel.org/engage/skills/hiprod.htm>.

<sup>26</sup> From <http://courses.washington.edu/benefit/site.html> (accessed October 9, 2006).

## INDICATORS OF TECHNICAL FLUENCY

Technical fluency reflects a person's ability to understand, explain, and discuss technical tools and concepts. The transfer of technology know-how involves imparting knowledge from one person to another. The name "tech fluency" is used to identify this concept. To design a survey instrument for tech fluency, we turned to the key research publication *Being Fluent with Information Technology*, published by the National Research Council (NRC)<sup>27</sup> and the Computer Science and Telecommunications Board (CSTB) in 1999. The NRC and the CSTB characterize tech fluency in term of fluency with information technology ("FITness"):

FITness entails a process of lifelong learning in which individuals continually apply what they know to adapt to change and acquire more knowledge to be more effective at applying information technology to their work and personal lives.<sup>28</sup>

Because technology changes and advances so rapidly, fluency implies more than just learning a specific skill. Fluency also includes the ability to learn and adapt as changes occur. This ability is divided into three separate but equal categories.<sup>29</sup>

- Foundational concepts
- Intellectual capabilities
- Contemporary skills

According to a study conducted by the NRC and the CSTB, "the skills, linked closely to today's computer usage, change over time, but the concepts and capabilities are timeless... Each of the three elements of FITness is essential and each is equal to and reinforces the others."<sup>30</sup>

**Foundational concepts** refer to the foundations on which information technology is built. This is the book learning part of fluency. "Familiarity with computer operations, networks and infrastructure, and technology issues constitute the baseline for a fundamental knowledge of computer technology."<sup>31</sup> Using three foundational concepts questions from a study of tech fluency conducted at Southwestern University,<sup>32</sup> we asked the participants in our survey to respond to the following statements:

1. I can identify between hardware and software problems.
2. I can explain how a computer operates and processes information.

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<sup>27</sup> The National Research Council is a part of the National Academies, which for more than 100 years have provided independent advice on issues of science, technology, and medicine that underlie many questions of national importance.

<sup>28</sup> *Being Fluent with Information Technology*, p.2.

<sup>29</sup> "IT Fluency: What Is It and Why Do We Need It?" by Herbert S. Lin, 2002. In *Technology Everywhere: A Campus Agenda for Educating and Managing Workers in the Digital Age*, Brian L. Hawkins, Julia A. Rudy, and William H. Wallace, Jr., Editors, Jossey-Bass, A Wiley Company, <http://www.educause.edu/ir/library/pdf/pub7006f.pdf>.

<sup>30</sup> "IT Fluency: What Is It and Why Do We Need It?" p.43.

<sup>31</sup> "How Fluent with Information Technology Are Our Students?" by Sharon Fass McEuen, 2001. In *EDUCASE Quarterly*. <http://www.educause.edu/ir/library/pdf/EQM0140.pdf>

<sup>32</sup> "How Fluent with Information Technology Are Our Students?"

3. I can describe how email is transmitted from one computer to another.

We also presented participants with a fourth statement, not included in the Southwestern University study:

4. I understand the difference between computer storage and memory.

The **intellectual capabilities** of FITness refer to one's ability to apply information technology in complex and sustained ways and to understand the consequences of doing so. These capabilities transcend particular hardware or software applications and can be regarded as life skills that are formulated in the context of information technology. One question in our evaluation focused on the youths' intellectual capabilities regarding information technology:

5. I feel comfortable and confident when trying to use new or unfamiliar programs.

**Contemporary skills** refer to the ability to use a particular (and contemporary) hardware or software resource to accomplish information-processing tasks. These skills embody the intent of the phrase "knowing how to use a computer" as that phrase is colloquially understood. They include (but are not limited to) the use of several common software applications. The "skills" component of FITness necessarily changes over time because information technology products and services continually change. Our evaluation included two contemporary skills questions:

6. I would be able to read and understand HTML (Hypertext Markup Language).
7. I can easily learn new software applications.

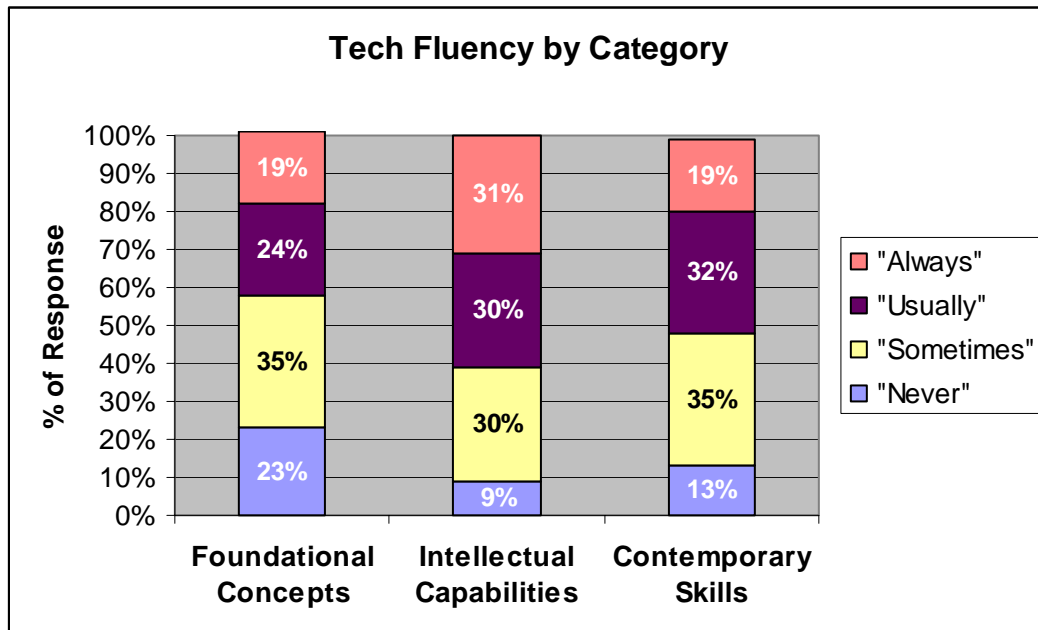
To evaluate tech fluency, we presented participants with the above seven statements and asked them how often each statement was true for them. Participants could answer "Never," "Sometimes," "Usually," or "Always." Each answer was converted to the numeric values 1–4, where 1 = "Never" and 4 = "Always." In analyzing the survey results, we assumed that the more often participants answered "Always," the higher their perceived tech fluency. Conversely, the more often they answered "Never," the lower their perceived tech fluency.

For some of our analysis, we present tech fluency in terms of the percentage of time participants gave each response. For example, participants newest to the program responded "Never" to the Foundational Skills statements 33% of the time. In other cases, we used the numeric value of each answer to produce a single number that represented tech fluency. So to compare tech fluency by age, we show the numeric score for teens (2.57) versus preteens (2.41).

## RESULTS: TECH FLUENCY BY CATEGORY

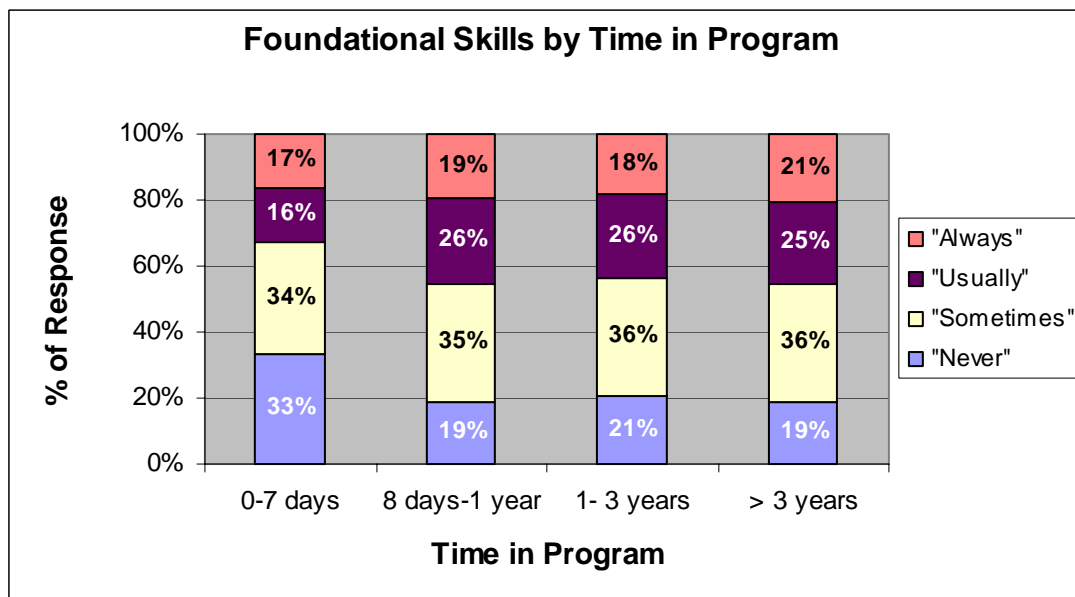
We found that youth appear to be the least confident in their **foundational concepts** and are fairly confident in their **intellectual capabilities** and **contemporary skills**. The answer "Never" was selected an average of 23% of the time for the four statements in the foundational skills category (see statements #1-4 above). In comparison, "Never" was selected only 9% of the time for the question addressing intellectual capabilities.

CHART 18: TECH FLUENCY BY CATEGORY



While foundational concepts appear to be the weakest tech fluency category, they did improve the longer youth participated in a program. As shown in the chart below, the percentage of youth selecting “Sometimes” and “Always” increased with time in program. In addition, the percentage of youth selecting “Never” dropped from 33% for youth who had been in the program for 0-7 days down to 19% for youth who had been in the program for more than 3 years.

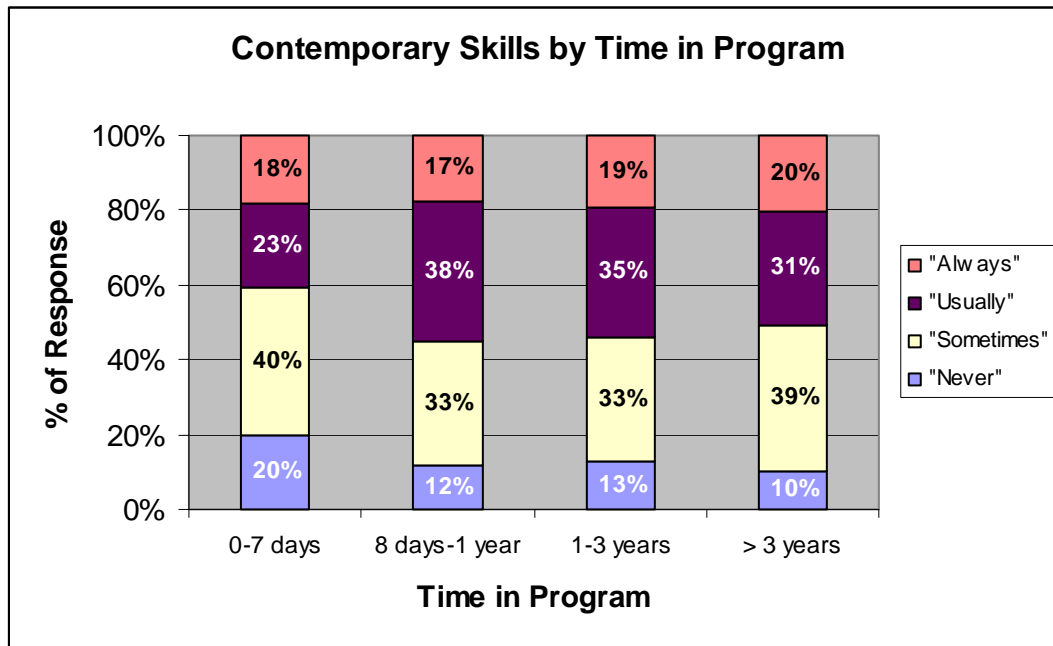
CHART 19: FOUNDATIONAL SKILLS BY TIME IN PROGRAM



These findings indicate that youth are improving their foundational concepts. As the youth continue to learn, they'll build upon these concepts, which will serve as a vital base of knowledge as they move forward and continue to hone their 21<sup>st</sup> Century Skills.

For **contemporary skills**, the percentage of youth selecting “Never” dropped by 10% for youth who had been in the program for more than three years compared with those participating for only 0-7 days.

CHART 20: CONTEMPORARY SKILLS BY TIME IN PROGRAM



The percentage of youth selecting “Never” also decreased over time for **intellectual capabilities**, and the percentage of youth selecting “Always” steadily rose. These findings support the theory that technology programs improve confidence in tech skills over time for the participating youth.

## EFFECT OF TIME IN PROGRAM

We found that, similar to DAP scores, perceived tech fluency increases over time. However, while DAP scores increased the most for youth who were new to the programs, the opposite was true regarding tech fluency. **The greatest increases in tech fluency were seen for youth who participated in the programs for more than three years.** The longer the youth participated in the program, the less likely they were to select “Never” when asked about their tech fluency skills, and the more likely they were to select “Always.” This result indicates that improving tech fluency skills is a long-term goal for technology programs.

## Results for All Participants

To examine the effect of length of time in a program on tech fluency, we categorized participants according to how long they had been participating in the program when they completed their first survey (0–7 days, 8 days–1 year, 1–3 years, or more than 3 years). The following table illustrates the number and percentage of youth in each category:

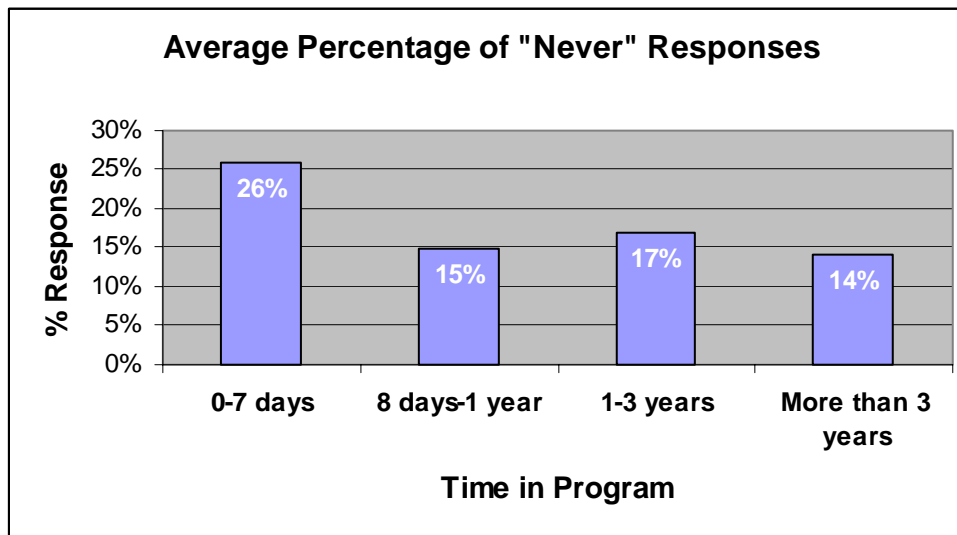
TABLE 17: HOW LONG PARTICIPANTS HAD BEEN IN PROGRAM AT TIME OF FIRST SURVEY (ALL PARTICIPANTS)<sup>33</sup>

TIME IN PROGRAM	NUMBER	PERCENTAGE
0-7 days	169	21%
8 days-1 year	181	23%
1-3 years	345	43%
More than 3 years	99	13%

We found that tech fluency and time in program are positively correlated (to a statistically relevant degree).<sup>34</sup> Tech fluency increased over time for all participants as well as for the 85 youth in the matched set. Six out of the seven questions used to measure this indicator consistently increased over time for all participants.

**For all participants, the percentage of youth responding “Never” to the tech fluency statements decreased the longer they had been in the program.** As the chart below illustrates, 26% of participants who had been in the program 0–7 days answered “Never,” compared with only 14% of youth who had been in the program for more than three years.

CHART 21: AVERAGE PERCENTAGE OF “NEVER” RESPONSE BY TIME IN PROGRAM (ALL PARTICIPANTS)



Conversely, **the percentage of youth who answered “Always” increased the longer the youth were in the program.** Of the youth who participated for 0–7 days, 17% said they “Always” had the

<sup>33</sup> There are a total of 885 youth; however only 794 answered the question, “How long have you participated in the program?”

<sup>34</sup> Correlation is significant at the 0.01 level.

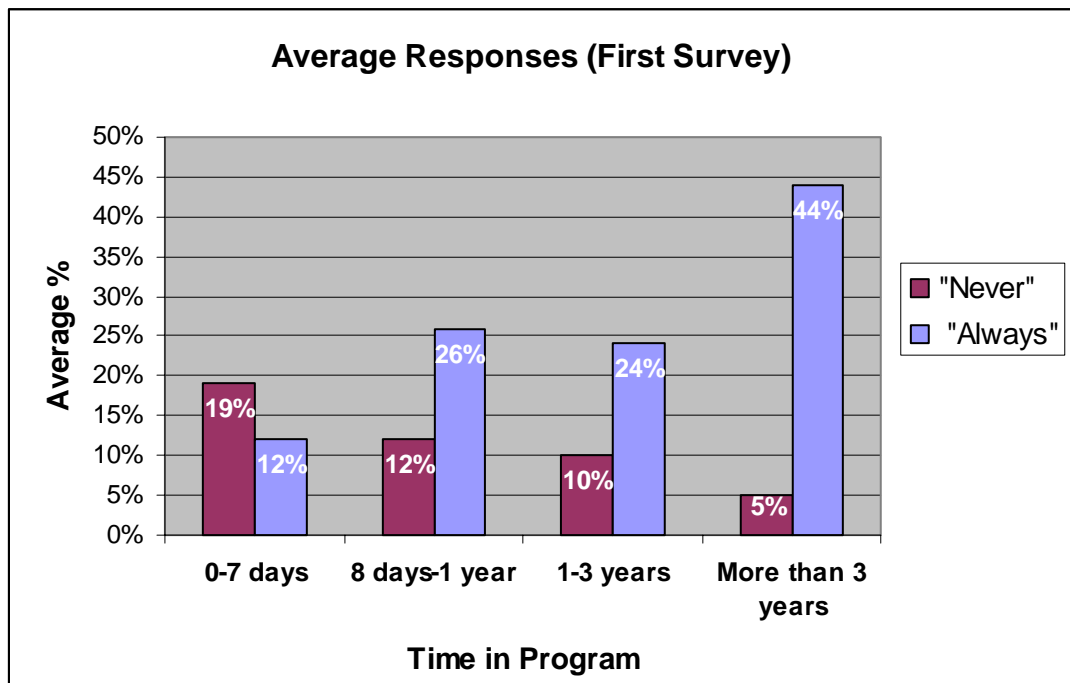
skills mentioned. In comparison, 20% of youth who had participated for more than three years answered “Always.”

These findings indicate **that the longer the youth participated in a program, the stronger their tech fluency skills became.**

### Results for Matched Set

The same correlation holds true for the matched set. Participants who were new to the programs (0-7 days) selected “Never” more frequently than any other “Time in Program” category. In addition, youth who had been in the programs for more than three years selected “Always” the most often. These patterns are illustrated in the following chart:

CHART 22: AVERAGE PERCENTAGE OF “ALWAYS” AND “NEVER” RESPONSES  
(MATCHED SET, FIRST SURVEY)



By tracking the matched set’s tech fluency answers from survey to survey, we can see that youth who have been participating in a technology program for **more than one year** demonstrate the highest rates of technical fluency. These groups have low rates for selecting “Never”; in fact, no youth in the “More than 3 years” category selected “Never” when they took the third survey.

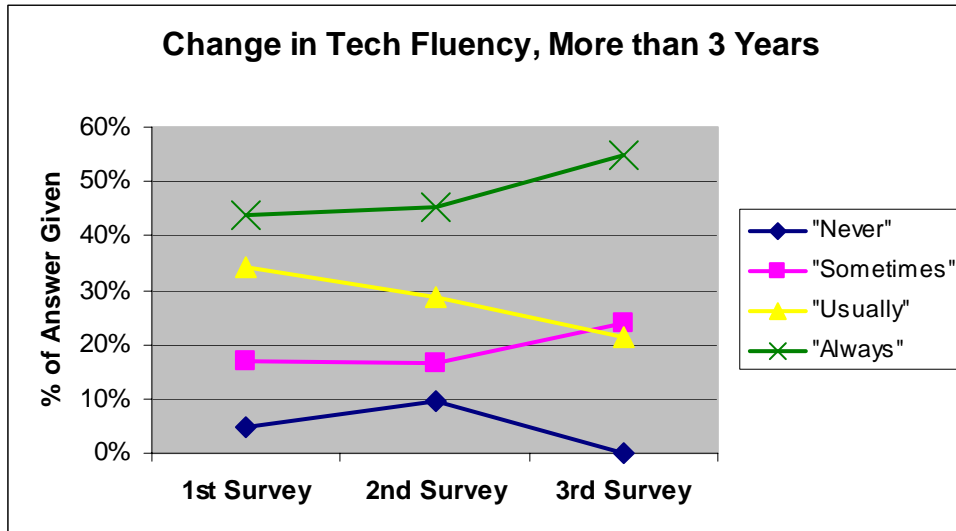
This trend is supported when the responses given by the youth in the matched set are categorized by time in program:

- **0–7 Days:** This group does show some improvement in perceived tech fluency over time. In the first survey, they selected “Always” only 12% of the time. When the group took the third survey, “Always” represented 21% of the answers given.

- **8 days–1 year:** “Never” was selected less frequently, and “Always” was selected 26% of the time when the first survey was taken (compared with only 12% for the previous group of participants who had been in the program from 0 to 7 days.)
- **1–3 years:** The percent of “Never” selections continued to fall and “Always” was selected more frequently than in the groups by reported length of involvement in a program.

The greatest improvement in tech fluency occurred in youth who had been participating in the technology programs for more than three years when they took the first survey. No youth in this group selected “Never” when they took the third survey, and “Always” was selected the most frequently each time the survey was taken. These findings are illustrated in the chart below:

CHART 23: TECH FLUENCY CHANGE OVER TIME FOR PARTICIPANTS IN PROGRAMS MORE THAN THREE YEARS



### Implications

These programs play an important role in teaching the participating youth the 21<sup>st</sup> Century Skills they need for success. The longer the youth participate in the programs, the stronger their skills become. Programs should consider encouraging youth to begin participating in their programs when they are preteens, allowing them to participate for multiple years and have adequate time to grow and develop their skills.

In contrast to our findings for DAP scores, which were highest for youth new to the programs, tech fluency increases the most for youth who have been in the programs for more than three years.

**Therefore, developing tech fluency skills (and feeling confident in those skills) should be viewed as a long-term goal.**

## RESULTS: TECH FLUENCY AND DAP SCORES

Six of the seven tech fluency indicators correlate positively with DAP scores. This means that **the more confident youth are in their technical skills, the higher their DAP score**. The following indicators are correlated at the 0.05 significance level:

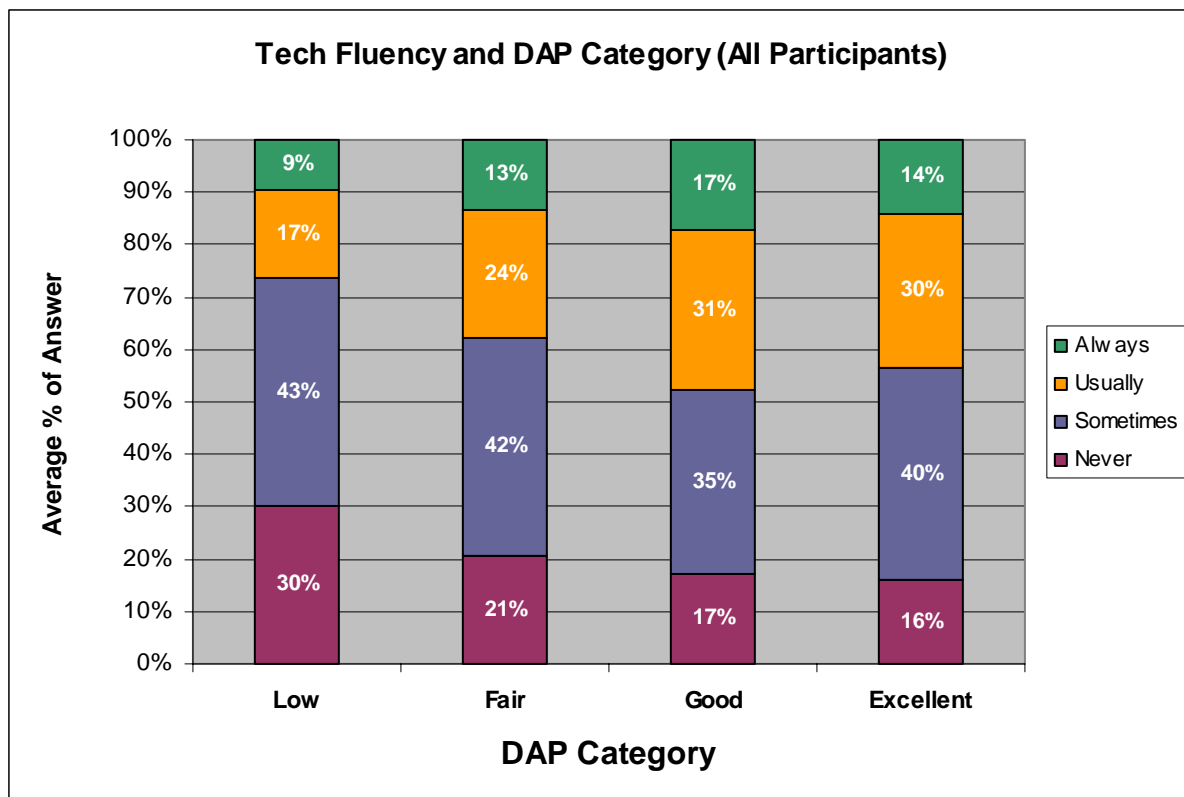
- I can identify between hardware and software problems.
- I understand the difference between computer storage and memory.
- I feel comfortable and confident when trying to use new or unfamiliar programs.

Tech fluency indicators correlated with DAP scores at the 0.01 significance level include:

- I would be able to read and understand HTML.
- I can easily learn new software applications.
- I can explain how a computer operates and processes information.

In the chart below, DAP scores are divided into the four categories we used in the analysis in Section I of this report: Low, Fair, Good, and Excellent. As DAP scores increased from category to category, the percentage of youth indicating “Never” (magenta bars) decreased and the percentage answering “Always” (green bars) increased, with a peak for youth in the “Good” category.

CHART 24: TECH FLUENCY AND DAP CATEGORY

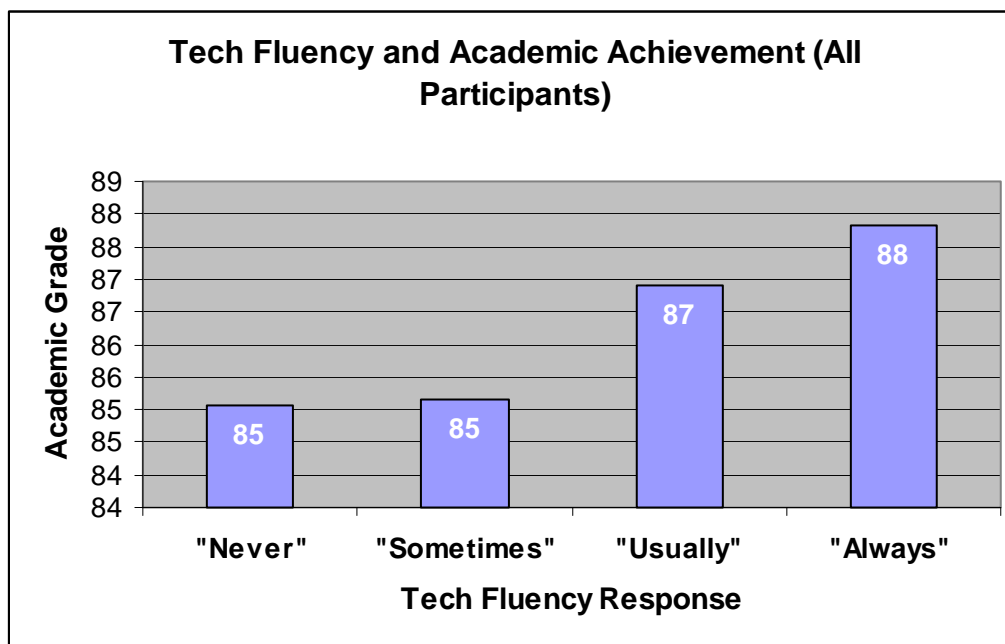


## EFFECT OF ACADEMIC ACHIEVEMENT, AGE, GENDER, AND PROGRAM TYPE

### Effect of Academic Achievement

Tech fluency and academic achievement are positively correlated; as one improves, so does the other. The graph below illustrates this relationship. Youth who answered “Always” for tech fluency skills reported the highest average grade (88). Youth who answered either “Never” or “Sometimes” reported the lowest average grade (85).

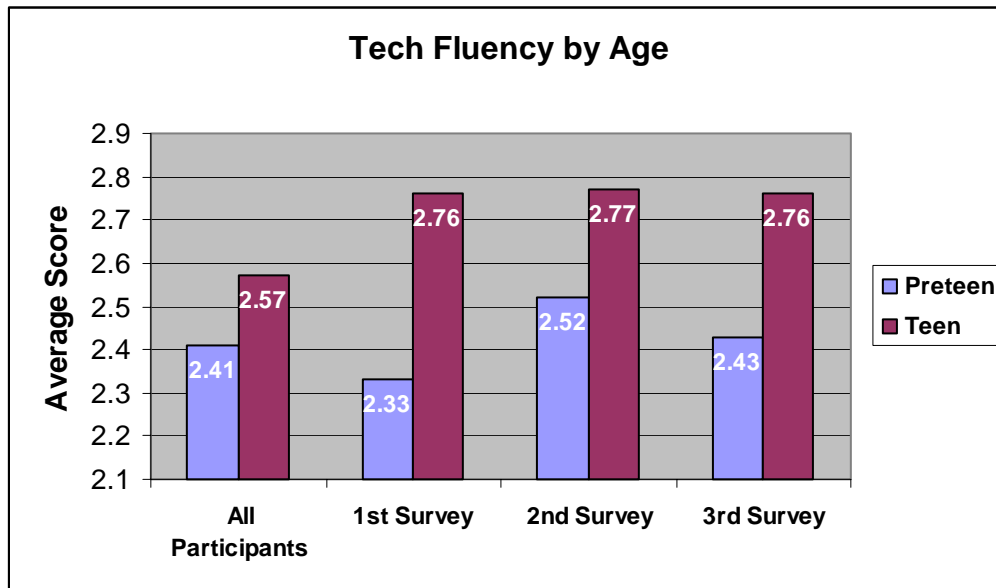
CHART 25: RELATIONSHIP BETWEEN TECH FLUENCY AND ACADEMIC ACHIEVEMENT (ALL PARTICIPANTS)



### Effect of Age (Teen vs. Preteen)

When the tech fluency answers are recoded into quantifiable outcomes, we see that the scores are higher for teens than for preteens. Teens had an average tech fluency score of 2.57 (1 = “Never” and 4 = “Always”), while preteens had an average score of 2.41. This pattern remained true for the matched set. Teens had higher tech fluency scores than preteens on each of the three surveys:

CHART 26: TECH FLUENCY BY AGE



#### Effect of Gender (Male vs. Female)

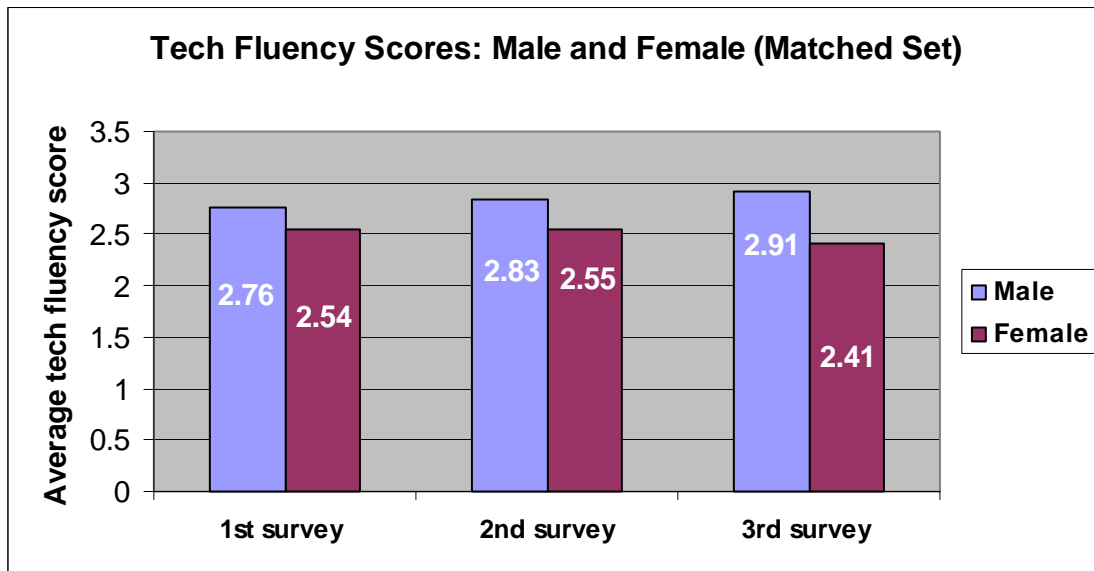
For all participants, males had higher tech fluency scores than females. This finding is consistent with a study of tech fluency skills at Southwestern University:

“The American Freshman: National Norms for Fall 2000” revealed that male and female college students have identical rates of computer use, but the men are twice as likely as the women to have a high opinion of their skills...The majority of males see themselves as having a higher fluency...than do females.<sup>35</sup>

Again using the numeric measure of tech fluency, we found that for all participants, the average tech fluency score was 2.60 for males and 2.36 for females (1= “Never” and 4 = “Always”). In the matched set, tech fluency scores for male participants rose with each survey; and in each survey they were higher than the scores for female participants.

<sup>35</sup> “How Fluent with Information Technology Are Our Students?” page 11.

CHART 27: TECH FLUENCY BY GENDER (MATCHED SET)



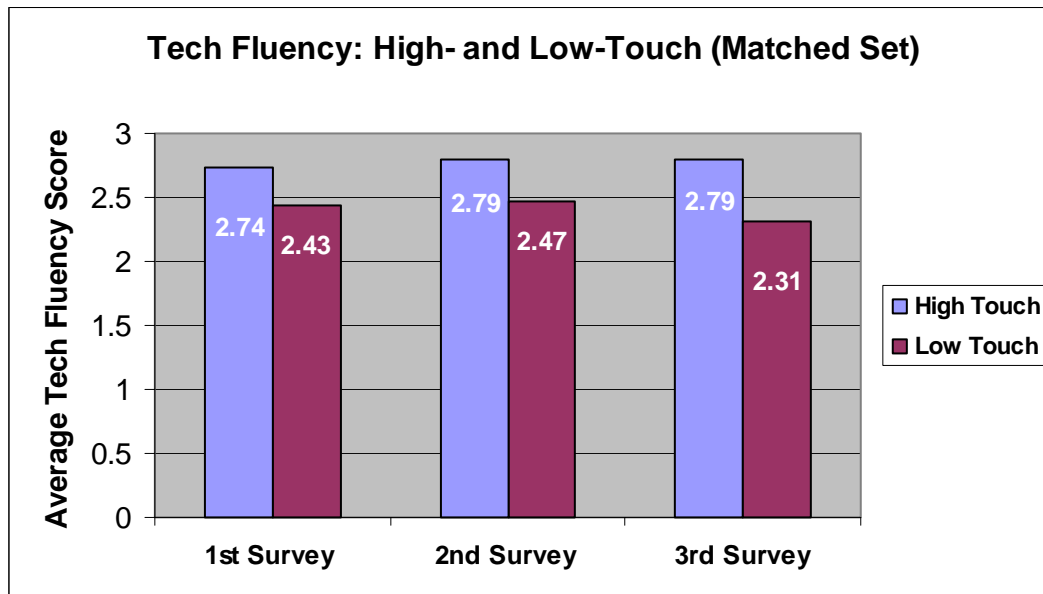
As the chart shows, female participants' tech fluency scores dropped in the third survey, but male scores were higher in the third survey than they were in the first. Female tech fluency scores increased in the second survey and decreased in the third survey, ending lower than they began.

#### Effect of Program Type (High- vs. Low-Touch)

Participants in high-touch programs reported higher tech fluency than those in low-touch programs. For all participants, those in high-touch programs had an average tech fluency score of 2.57, while those at low-touch sites had an average score of 2.42.

Again, this pattern remained true for the matched set: participants in high-touch programs report higher levels of tech fluency in all three surveys. For both high-touch and low-touch programs, average tech fluency scores peak in the second survey:

CHART 28: TECH FLUENCY BY PROGRAM TYPE (MATCHED SET)



### Implications

As we have seen, on average, tech fluency scores increased over time, indicating that these programs are an effective method for strengthening youths' confidence in their technology skills. The longer the youth participate in the programs, the less likely they are to say that statements reflecting technical skills (like "I can easily learn new software applications") are **never** true, and the more likely they are to say that they are **always** true.

However, tech fluency skills didn't increase for some participating youth, most noticeably for females and youth in low-touch programs. For females, this may be more an issue of confidence rather than skill. Research shows that males and females tend to have the same level of skill but differing amounts of confidence in those skills. **Technology programs should focus on increasing the confidence of the females who attend their programs.** They must go beyond simply teaching girls skills; they must also give them the confidence to believe in and use their skills in a meaningful way. Increasing the female participants' confidence, and thereby their ability to express their true knowledge, is a key aspect of the communication skills associated with 21<sup>st</sup> Century Skills.

The fact that youth in low-touch programs have lower tech fluency skills indicates that kids need more than just access to improve their skills. High-touch programs are more structured and tend to offer guided projects and classes. Youth are encouraged to learn, create, and work with leaders and their peers. Low-touch programs tend to be less structured and offer more lab time, rather than classes. The results of our study indicate that youth need guidance and structure to truly enhance their skills. Programs that offer access only may indeed provide a safe and positive place for youth to congregate outside school. But while such an environment may be valuable in and of itself, it's not the same as actively working to increase technical skills. Programs intended to strengthen the tech fluency skills of their participants should consider incorporating some aspects of high-touch programs (such as structured classes and projects and highly engaged program staff).

### III. OUTLOOK FOR THE FUTURE

#### SUMMARY

Believing you can accomplish something is the first step toward success. Despite the odds that they face in terms of graduation rates and college readiness, the youth studied here are still largely optimistic about themselves and what they can accomplish. In fact, the longer the youth participated in these programs, the more positive their attitudes became. **Youth who participate in these programs believe that they will do better in school, attend college, and get a good job after they finish school.** Females especially showed an increasingly positive outlook for the future. And the longer they participated in the program, the better their outlook became.

This positive mindset is powerful, and research shows that a positive attitude and belief that one will attend college is linked to actual college attendance rates. According to research published in the *American Education Research Journal*<sup>36</sup>, "... favorable attitudes toward higher education, parental encouragement, and friends' college plans all lead to the formation of intentions to enter college. Intentions, in turn, predict actual college attendance." Intentions of attending college are shaped by "academic achievement and by perceived academic ability, in addition to attitudes and perceived social norms." Participating in these programs positively affected all these factors.

#### Key Findings

- Academic achievement.** Youth in these programs had higher-than-average grades at the beginning of the study, a difference that remained stable over time. The following table juxtaposes national average grades with the average grades of the participating youth:<sup>37</sup>

TABLE 18: ACADEMIC GRADES OF PARTICIPANTS VS. NATIONAL AVERAGE

MEAN GPA/GRADE		
YEAR IN SCHOOL	NATIONAL	PARTICIPATING YOUTH
9 <sup>th</sup>	76 (C)	84 (B)
10 <sup>th</sup>	73 (C)	85 (B)
11 <sup>th</sup>	73 (C)	86 (B)
12 <sup>th</sup>	74 (C)	84 (B)

<sup>36</sup> "Linking Intentions and Behavior: Australian Students' College Plans and College Attendance" by Peter G. Carpenter, John A. Fleishman. *American Educational Research Journal*, Vol. 24, No. 1 (Spring, 1987), pp. 79-105. [http://links.jstor.org/sici?sici=0002-8312\(198721\)24%3A1%3C79%3AIIABAS%3E2.0.CO%3B2-P](http://links.jstor.org/sici?sici=0002-8312(198721)24%3A1%3C79%3AIIABAS%3E2.0.CO%3B2-P)

<sup>37</sup> From *The Nation's Report Card*, by National Assessment of Educational Progress, 2005. [http://nationsreportcard.gov/hsts\\_2005/hs\\_gpa\\_3a\\_1.asp?tab\\_id=tab5&subtab\\_id=Tab\\_1#chart](http://nationsreportcard.gov/hsts_2005/hs_gpa_3a_1.asp?tab_id=tab5&subtab_id=Tab_1#chart)

- **Perceived academic ability.** The longer the youth participated in these programs, the more confident they became about their ability to do better in school and the stronger their belief that they would one day attend college. For example, 70% of the youth felt that participating in these programs would help them improve their study skills.

In our matched set, youth showed the following changes in outlook with regard to school performance:

- More youth believed they would improve their study skills (from 60% to 70%).
- More youth believed they would graduate from high school (from 72% to 76%).
- **Perceived job readiness.** In our study we saw the following changes regarding job skills and readiness:
  - Seventy-seven percent of the youth who were new to the program reported that they expected to get a good job, compared with 90% of kids who had been in a program for more than three years.
  - After time in a program, more youth said they would get a good job when they were done with school (88% vs. 83%).
- **Attitudes and perceived social norms.** By engaging in these programs, youth are surrounded by an atmosphere where education, learning, and success are the social norms. Thinking critically is expected, and academic success and attending college are encouraged. For many youth, this may be the only place where these educational pursuits are valued or supported.

All these factors result in youth having a positive attitude about their future, an outlook that grows stronger the longer they participate in these programs.

Based on the impact of programs on specific populations, the results of our study suggest the following **strategic programming opportunities**:

- **High-touch programs focus on long-term goals, low-touch on immediate goals.** More youth in high-touch programs thought they would help them go to college (70% vs. 60%). However, more youth in low-touch programs thought participation would help them in school (67% vs. 62%). This implies that high-touch programs put more focus on preparing for the future while low-touch programs focus on succeeding today. Depending on their philosophy, organizations might want to consider emphasizing one or the other.
- **Preteen have a more positive outlook than teens.** As youth mature, programs need to do more to help them see their potential and possibilities for the future.
- **Females' outlook improves more than males'.** In our matched sample, females showed greatest gain in outlook. This speaks to the added confidence that is linked to tech fluency.
- **Unique skills are acquired in the first year.** Youth reported that they acquired the most skills that cannot be learned elsewhere in the first year of participation.

## INDICATORS OF FUTURE OUTLOOK

To measure participants' general outlook on their future and the usefulness of the programs, we asked how the skills they were learning would help them in specific ways in the future. Our survey asked the youth to select from the following list:

- Graduate from school or go to college
- Improve my English
- Get a good job
- Do better in school
- Get along better with family, friends and others
- Be a leader
- Help others
- Become more independent
- Make friends and fit in
- Make better choices
- Have a better life
- Be a better person

They could select as many items as they wanted. In the discussion below, we refer to these 12 statements as “future outlook indicators.”

In addition, we also wanted to know what specific things youth felt they could accomplish in school or work as a result of program participation, and presented them with the list below.

“Because of my participation in this program I am hopeful that...”

- I will do better in school.
- I will improve my study skills.
- I will one day finish high school.
- I will get a good job when I am done with school.
- I will one day go to college.

When asked if they agreed with each statement, participants could answer “agree,” “disagree,” or “not applicable.” In the discussion below, we refer to these five statements as “educational/vocational outlook indicators.”

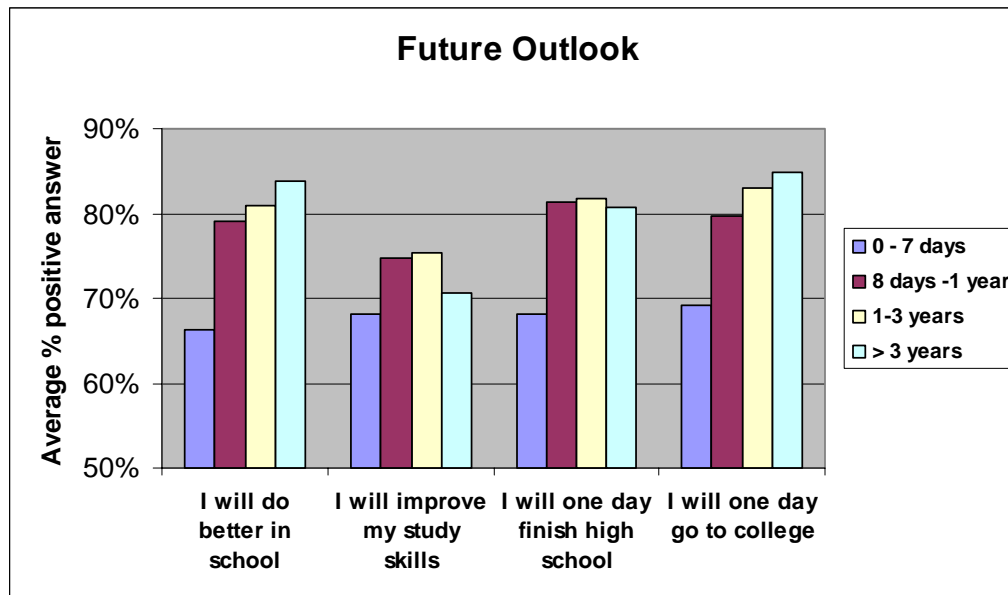
## RESULTS: SCHOOL PERFORMANCE AND PARTICIPATION

We found that the youth’s general outlook on their future, like their DAP scores and tech fluency, increased over time in a program. This indicates that participating in these tech programs not only increases youths’ technical skills, but it also improves their outlook on what they can do or be as well. **Youth who participate in these programs believe that they will do better in school, attend college, and get a good job after they finish school.**

Although their average academic grades did not dramatically change during the time they participated, program participants strongly felt that the tech programs were helping them in school.

The chart below illustrates the relationship between youths’ belief that they would do better in school related to their increased involvement in a technology program. The more time the youth had been involved in the program, the higher the percentage who responded positively to the statements “I will do better in school” and “I will one day go to college.”

CHART 29: FUTURE EDUCATIONAL OUTLOOK BY TIME IN PROGRAM



This pattern of improved outlook regarding performance in school was seen in the matched set as well. The percentage of youth who responded positively to the statements, “I will improve my study skills,” “I will one day finish high school,” and “I will get a good job when I am done with school” increased in the third survey:

TABLE 19: EDUCATIONAL OUTLOOK—FIRST SURVEY VS. THIRD SURVEY

SURVEY QUESTION	FIRST SURVEY	THIRD SURVEY
I will improve my study skills	60%	<b>70%</b>
I will one day finish high school	72%	<b>76%</b>
I will get a good job when I am done with school	83%	<b>88%</b>

### High-Touch vs. Low-Touch

The majority of matched set participants in both high- and low-touch programs felt that participating in the tech programs was helping them succeed. But participants differed on how, exactly, they thought the program would help them most. A larger percentage of high-touch participants felt that the program would help them graduate from school or go to college, while more low-touch participants felt that the program was helping them do better in school.

As the following table shows, 70% of youth in high-touch programs responded positively to “Graduate from school or go to college,” compared with 62% of youth in low-touch programs. In addition, 67% of low-touch program participants responded positively to “Do better in school,” compared with 60% of youth in high-touch programs:

TABLE 20: EXPECTATIONS OF SCHOOL SUCCESS – HIGH-TOUCH VS. LOW-TOUCH PROGRAMS

FUTURE OUTLOOK	HIGH-TOUCH	LOW-TOUCH
Graduate from school or go to college	<b>70%</b>	62%
Do better in school	60%	<b>67%</b>

This contrast is likely a result of the programming differences between high- and low-touch programs. Many high-touch programs focus on advanced computer skills and provide structured classes and training. While this advanced learning may indeed help participants attend college, it could be less likely to help with school classes that may be unrelated to the technical skills they are gaining in the high-touch programs. Low-touch programs tend to have less-structured classes and more open lab time. This unstructured time may allow youth to focus on current school work, resulting in their higher positive response that the programs they participate in will help them do better in school.

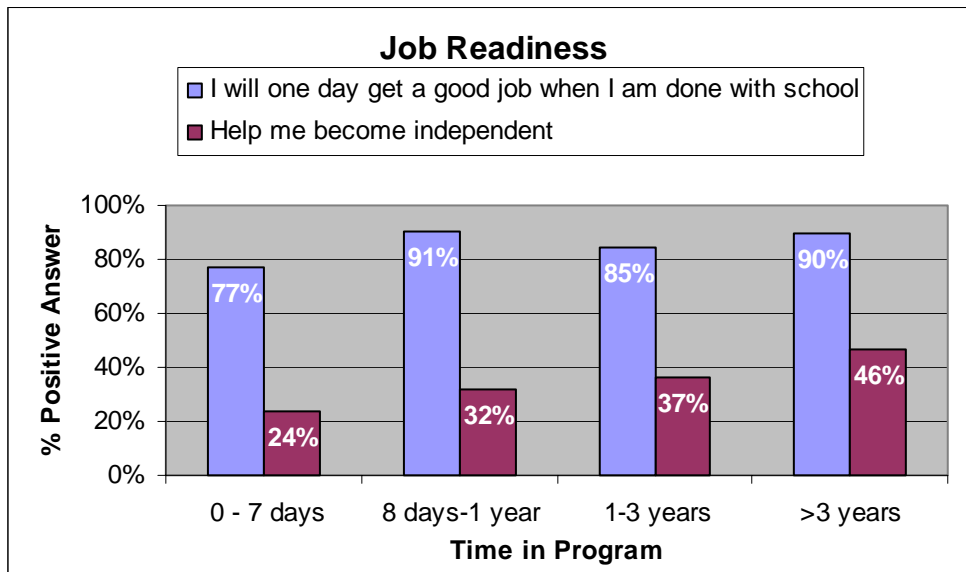
### RESULTS: JOB SKILLS AND READINESS

Given that only one-third of graduates nationally are job-ready after high school, the fact that these programs appear to help improve job readiness is a significant finding. The youth in our study felt that the technical programs they were participating in would help them get a better job and become independent. In fact, 72% of the youth agreed with the statement “Get a good job.” Of the twelve

indicators we used to measure future outlook, this statement had the highest percentage of positive responses.

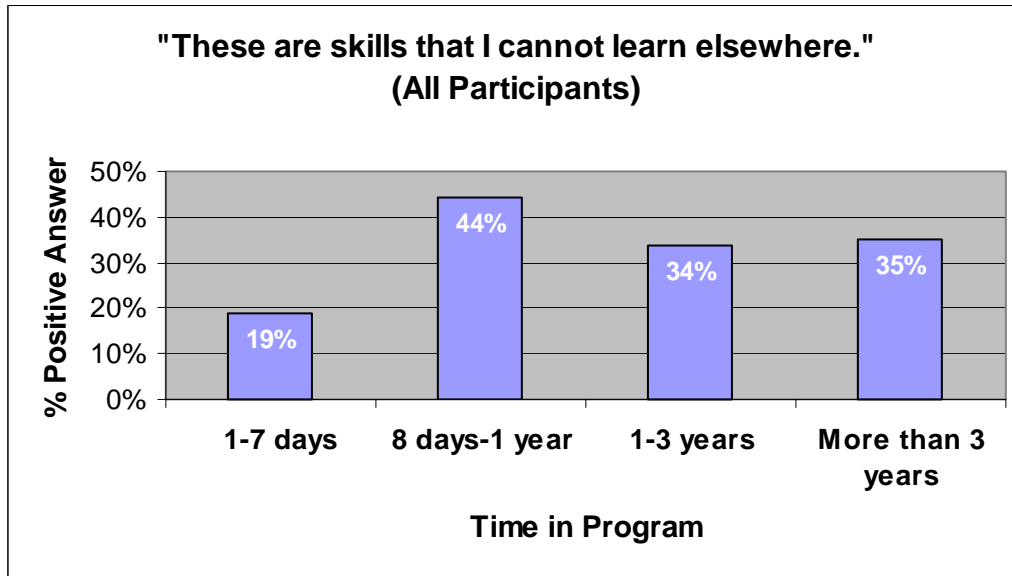
For almost all participants, the longer that youth participated in a program, the higher the percentage of positive answers for indicators related to getting a good job and becoming independent, as seen in the chart below.

CHART 30: OUTLOOK ON JOB READINESS BY TIME IN PROGRAM



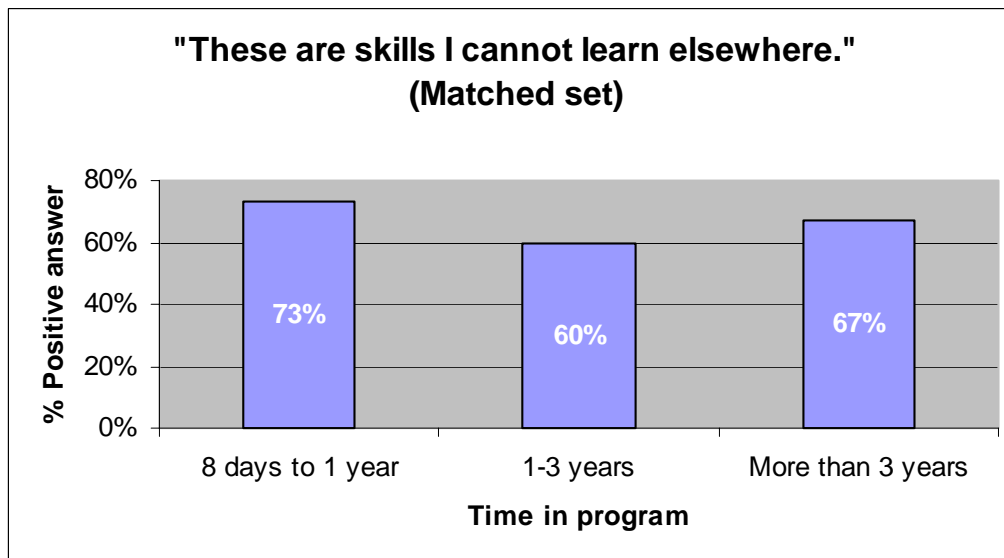
We also asked participants about the uniqueness of the skills they were acquiring. When we look at youth who had been participating for more than a week, we see an increase in the percentage of positive answers, with the highest coming from youth who had been participating for 8 days–1 year, followed by youth who had been participating 1–3+ years. These findings are illustrated in the chart below:

CHART 31: UNIQUE SKILLS LEARNED BY TIME IN PROGRAM (ALL PARTICIPANTS)



For the 85 youth in the matched set, we see the same pattern:

CHART 32: UNIQUE SKILLS LEARNED BY TIME IN PROGRAM (MATCHED SET)



This decrease could indicate that youth are learning the skills offered by these programs in a relatively short period of time (one year). Perhaps programs need to increase the difficulty of their programming to offer more challenging courses and materials to youth who participate in their programs for more than one year.

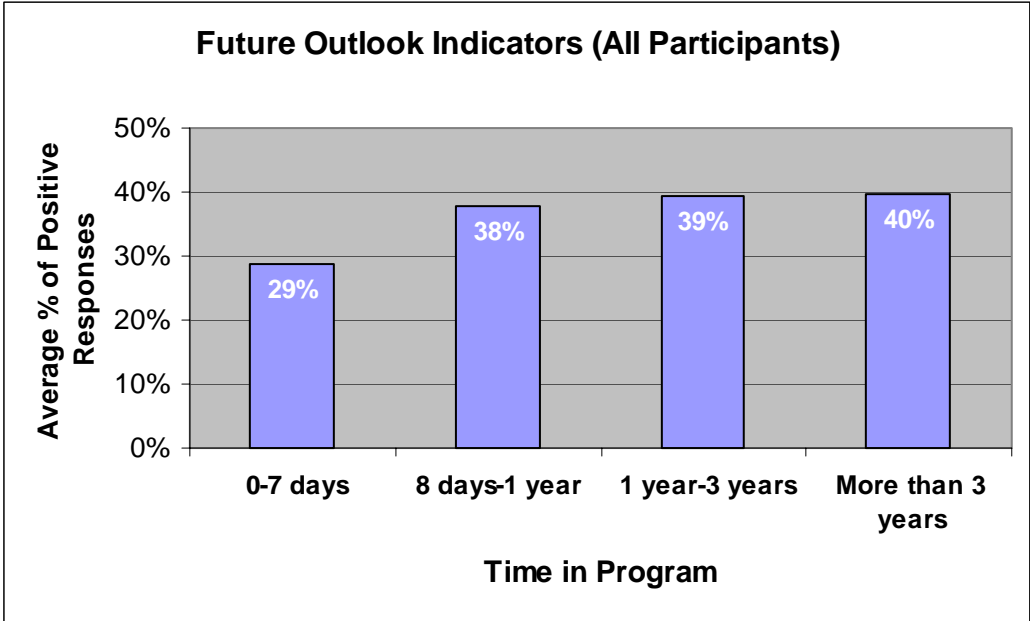
These findings indicate that the tech programs are helping youth believe that they will one day get a good job, as well as teaching them things they cannot learn elsewhere. This combination of a positive attitude about the future and attaining new skills will help youth move toward their goals.

## EFFECT OF LENGTH OF TIME IN A PROGRAM

The longer the youth participated in the technology programs, the more positively they viewed their future. Youth in programs for more than three years reported the highest percentage of positive answers (82%) in response to the five educational/vocational outlook statements.

In addition to having a more positive outlook, the longer youth participated in a technology program, the more confident they became regarding what they could do or be. To look at the youths' perception of specific competencies, we averaged the percentage of times the 12 future outlook statements were selected. We found that youth who were new to the program (0-7 days) selected only 29% of the statements on average, while youth who had been in the program for more than three years selected 40% of the statements. The following chart illustrates this increase:

CHART 33: FUTURE OUTLOOK BY TIME IN PROGRAM



This pattern of a more positive outlook over time is also seen across individual youth in the matched set from survey to survey. On eight of the 12 future outlook indicators, youth selected each statement more frequently in the third survey than the first survey. When we average the percentage of times each statement was selected, we find that the percentage of youth who had positive beliefs about their future increased over time, from 40% in the first survey to 43% in the third survey

These findings indicate that participating in these technology programs has a positive effect on the youths' outlook for the future over time. This is yet another indicator pointing to the importance of retaining youth in these tech programs over the long term once they become engaged. Program staff should invest time and develop programming that will encourage youth to remain in their programs for multiple years.

## EFFECT OF AGE (PRETEEN VS. TEEN)

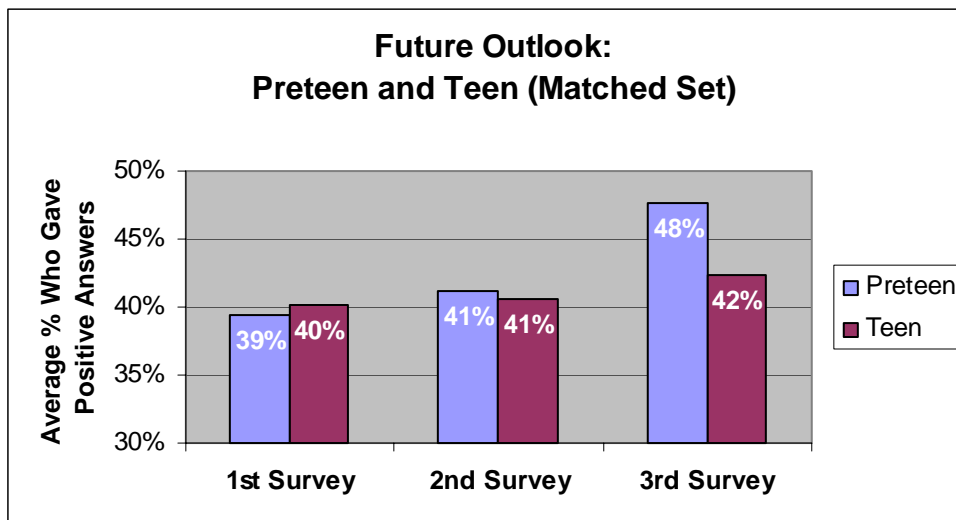
For all the participants, preteens (9-12 years old) had a slightly more positive general outlook on their future than teens (13-19 years old). In responding to the five educational/vocational outlook statements, preteens gave positive answers 79% of the time, while teens gave positive answers 75% of the time.

In the matched set, teens had a more positive outlook on their educational/vocational future in the first and second survey (75% and 84% for teens, compared with 69% and 76% for preteens). However, they dropped below preteens in the third survey (76% for teens, 78% for preteens). For preteens, the outlook became increasingly positive with each survey, while the positive scores for teens peaked in the second survey.

When we look at the 12 future outlook indicators, we see that for all participants, teens gave a higher percentage of positive answers than preteens. The rate of selections for teens was 38%, while the rate for preteens was 34%.

For the matched set, the percentage of times each answer was selected by both teens and preteens rose with each survey. While teens started with slightly higher scores, preteens experienced a larger increase over time and ended 6% higher than teens in the third survey. In the first survey, preteens selected each statement 39% of the time, while teens selected 40%. After the third survey, preteens' selection rate rose to 48%, while teens' rate only rose to 42%:

CHART 34: FUTURE OUTLOOK BY AGE (MATCHED SET)



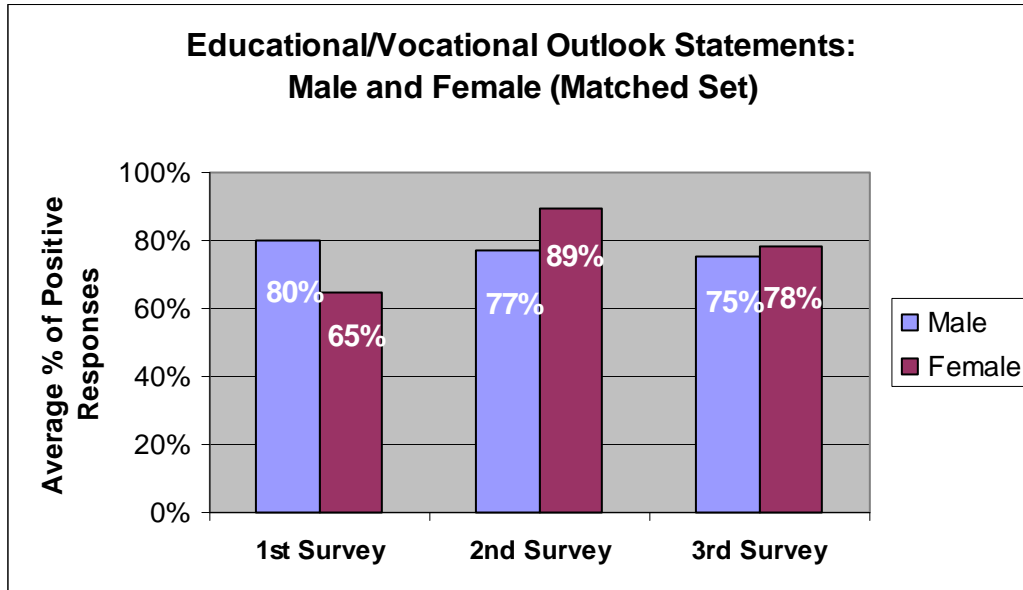
These findings indicate that while teens start with a more positive outlook than preteens, preteens catch up and pass them over time.

## EFFECT OF GENDER (MALE VS. FEMALE)

For all participants, there was virtually no difference between males (76%) and females (77%) regarding their responses to the five educational/vocational outlook statements. The matched set,

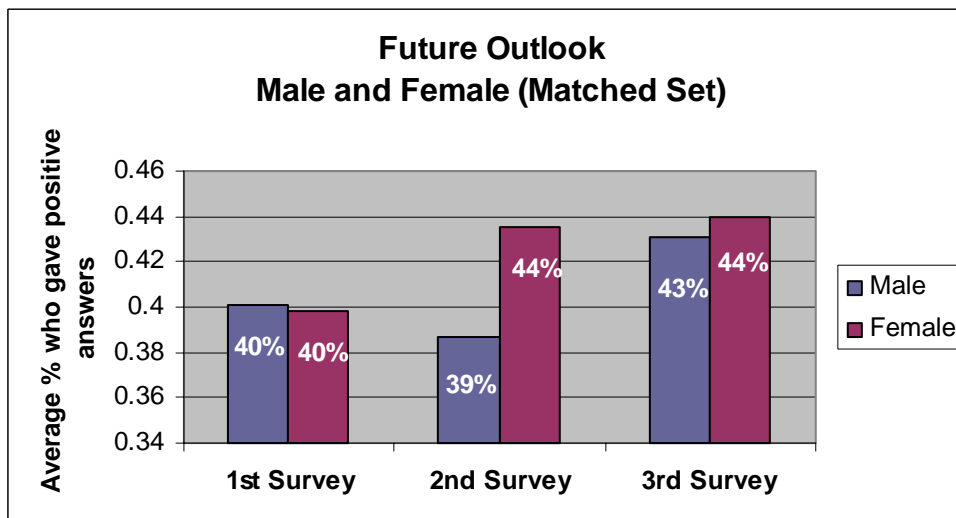
however, revealed an interesting trend. As the chart below shows, in the first survey, males started with higher scores, which then decreased with each survey. Scores for females, which started lower than scores for males, surpassed male scores in the second survey, and decreased slightly in the third to end slightly higher than male scores.

CHART 35: EDUCATIONAL/VOCATIONAL OUTLOOK FOR FUTURE BY GENDER (MATCHED SET)



We see a similar pattern when we look at the 12 future outlook indicators. In the matched set, males and females selected the same percentage of statements in the first survey (40%). The second survey saw an increase for females (44%) and a decrease for males (39%). In the third survey, males were back up above the results from their first survey (43%), but female selection rates remained higher (44%).

CHART 36: FUTURE OUTLOOK BY GENDER (MATCHED SET)



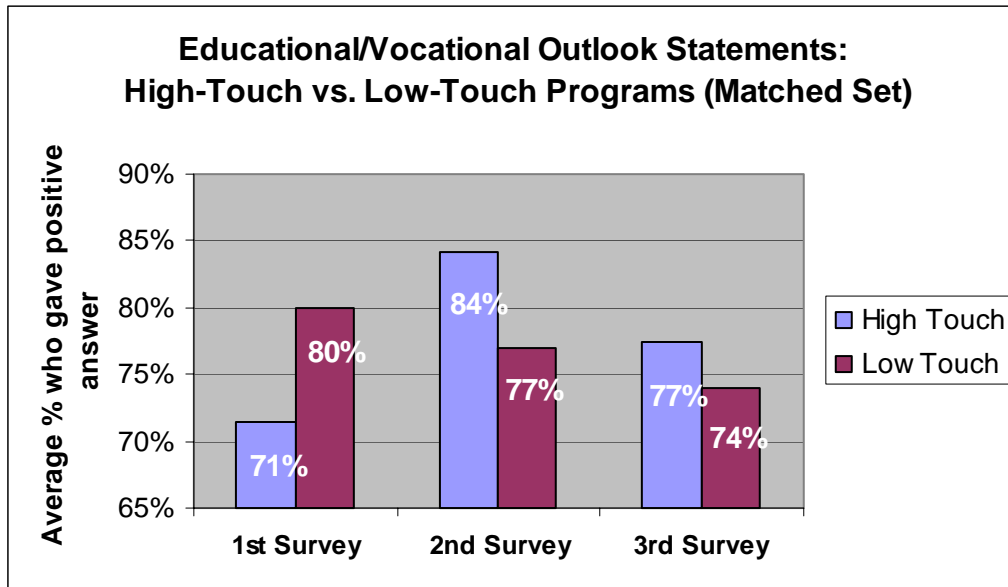
This suggests that participating in these programs is more beneficial for females in terms of outlook for the future. Program leaders may want to focus attention on the males in their programs and work with them to identify what will help them have a successful future and how they can get there. This specific attention to their future might help males improve their outlook over time.

### EFFECT OF PROGRAM TYPE (HIGH- VS. LOW-TOUCH)

For all participants, a slightly higher percentage of youth in low-touch programs (78%) reported having a positive future outlook than youth in high-touch programs (75%) when we look at the five educational/vocational outlook statements. This difference could be due to the fact that there are more preteens than teens in low-touch programs, and preteens have a more positive outlook for their future. Preteens represent 52% of participants in low-touch programs, and only 34% in high-touch programs.

A different pattern emerged for the matched set. In the first survey (see the chart below), participants in low-touch programs had a higher positive outlook on the future (80%) than those in high-touch programs (71%). However, in the second survey, this trend was reversed: results for high-touch (84%) were higher than low-touch (77%). In the third survey, positive outlook for the future dropped for both groups, but high-touch (77%) scores remained above low-touch (74%).

CHART 37: EDUCATIONAL/VOCATIONAL OUTLOOK BY TYPE OF PROGRAM (MATCHED SET)

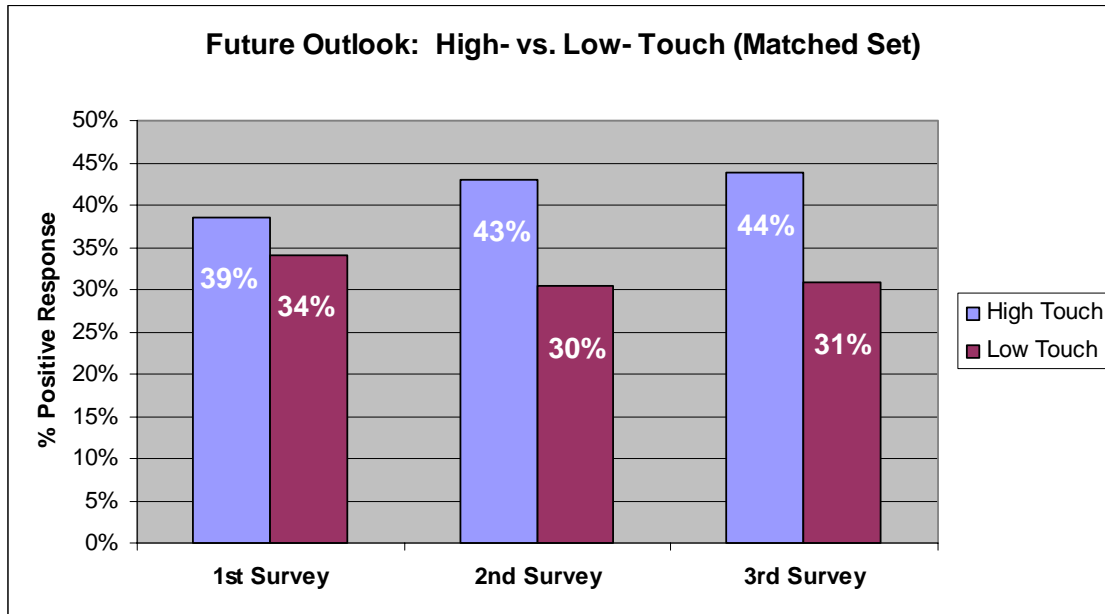


We see the reversal of this pattern when we look at the twelve future outlook indicators. For all participants, youth in high-touch programs reported higher positive responses than youth in low-touch programs. Here, an average of 39% of youth in high-touch programs agreed with each statement, while 34% of participants in low-programs agreed.

As the chart below shows, this pattern was also seen in the matched set. Participants in high-touch programs selected a higher percentage of statements for each survey. The percentage for participants

in low-touch programs dropped in the second survey, rose slightly in the third, and finished lower than they began.

CHART 38: FUTURE OUTLOOK BY TYPE OF PROGRAM (MATCHED SET)



## IMPLICATIONS OF FINDINGS

Over time, youth who participate in these programs believe more is possible for their future and their outlook improves. This result is encouraging for programs aimed at influencing youth in a holistic manner, teaching them life skills and a positive outlook as well as improving their technical skills.

Technology programs can take advantage of their positive effect on participating youth by building a component into their programs focusing on future opportunities. For example, the Tacoma Intel Computer Clubhouse takes participating youth on field trips to local businesses, allows them to job shadow adults working in their field of interest, and encourages them to pursue summer internships.

# APPENDIX A: KEY TERMS AND DEFINITIONS

The following terms are used throughout this report. This appendix is intended to provide a common understanding of these terms to ensure clarity as the report is read.

## 1) TECH PROGRAMS

The “tech programs” that were part of this evaluation all provided youth ages 9-19 with access to technology. They fall into two main categories:

- **Programs that exist solely to provide technology education.** While other skills may be incorporated, all programs and activities have a technology focus.
- **Programs that exist to give youth access to a variety of resources,** one of which is a technology lab. These programs may have several other types of programming; the technology focus is a component of a broader organization.

## 2) ALL PARTICIPANTS

This term refers to youth who took at least one survey. After invalid surveys were excluded, 885 surveys remained in this category.

## 3) MATCHED SET

This term refers to the set of 85 youth who completed the same survey three times between May 2005 and June 2006. Comparing responses on the three surveys for the same group of youth enabled us to analyze the effects of tech programs on this population over time.

## 4) HIGH-TOUCH AND LOW-TOUCH

Different programs have various levels of staff involvement, different curriculum, and different amounts of structure. To capture these differences (and analyze any effects on program participants), we categorized programs as either “high-touch” or “low-touch.” The criteria used for making this determination for each site is listed in the table below:

HIGH-TOUCH	LOW-TOUCH
Soft-skills development is present and seen as a high priority.	Soft-skills development may or may not be present.
Relationships between staff and participants are highly valued and viewed as an important part of the program.	Relationships between staff and participants may exist, but are not a high program priority.
High level of active, skilled, caring adult teacher/program leader involvement	Lower level of teacher/program leader involvement

HIGH-TOUCH	LOW-TOUCH
Lower ratio of adults to kids	Higher ratio of adult to kids
Majority of computer use is supervised, guided, and/or directed.	Computer use is unsupervised.

## 5) DEVELOPMENTAL ASSETS

Developmental assets are:

...“developmental vitamins” — positive experiences and qualities identified by Search Institute that are essential to healthy psychological and social development in childhood and adolescence. These assets have the power to influence young people’s developmental trajectories, protect them from a range of negative outcomes, and help them become more productive, caring, and responsible adults.<sup>38</sup>

There are both internal and external assets. (For a complete list, see the Search Institute website at <http://www.search-institute.org/assets/>.) The number of assets present in a youth’s life comprises their Developmental Asset Profile (DAP) score, which is defined below.

Developmental assets are closely related to a various behavioral and academic outcomes among youth, as demonstrated in the following table<sup>39</sup>:

LOW ASSET LEVELS ARE RELATED TO INCREASED RISK FOR:	HIGH ASSET LEVELS ARE RELATED TO POSITIVE OUTCOMES SUCH AS:
Academic underachievement	Academic achievement
Alcohol problems	Leadership
Tobacco problems	Thriving
Illicit drug use	Well-being
Precocious sexual activity	
Antisocial behavior and violence	

## 6) DEVELOPMENTAL ASSET PROFILE (DAP)

Our evaluation used the youths’ DAP score to measure the impact of tech programs on youths’ developmental assets. The following is a brief description of the DAP and its intentions:

<sup>38</sup> From, *Developmental Assets Profile Preliminary Users Manual*, January 2004, page 2.

<sup>39</sup> From, *Developmental Assets Profile Preliminary Users Manual*, page 2.

The Developmental Assets Profile has been developed in response to numerous requests over the years for an individual measure of development assets. The goal was to develop a new measure that would complement and extend the utility of existing asset measures, particularly the Search Institute Profiles of Student Life: Attitudes and Behavior (“A&B”) survey, which has been used in hundreds of communities across America with literally millions of youth over the last 10 years. The DAP was developed to complement the A&B survey: the two measures differ substantially and have distinct applications.<sup>40</sup>

As mentioned above, the DAP is similar to the A&B survey. Since our DAP results are compared with A&B findings, it is important to understand the similarities and differences between these two measurement tools. The following table illustrates the relationship between the DAP and Search Institute’s A&B:<sup>41</sup>

DAP	A&B
58 item checklist, takes about 10 minutes to complete (see Appendix F for the list of questions)	156 item survey, takes approximately 40-50 minutes to complete
Focuses exclusively on assets	Covers developmental assets, risk behavior, thriving indicators and a few deficits
Designed for individual results	Designed for large-scale surveys
Is an individual measure that yields quantitative scores for asset categories and context areas portrayed in a profile format	Does not provide individual measure; yields aggregate reports for groups of youth
Cannot be used to determine the presence or absence of each of the 40 assets	Provides detailed assessment of the presence or absence of each of the 40 developmental assets
Designed to be sensitive to changes in reported assets over time and is suited for research and program evaluation	Not designed for measuring changes in assets over time or for purposes of program evaluation

## 7) TEEN AND PRETEENS

“Preteens” are defined as youth between the ages of 9–12. “Teens” are defined as youth between the ages of 13-19.

<sup>40</sup> From *Developmental Assets Profile Preliminary Users Manual*, page i.

<sup>41</sup> Information in the table summarized from *Developmental Assets Profile Preliminary Users Manual*, page 2.

## 8) TECH FLUENCY

To design a survey instrument for tech fluency, we turned to the key research publication *Being Fluent with Information Technology* published by the National Research Council (NRC)<sup>42</sup> and the Computer Science and Telecommunications Board (CSTB) in 1999. The NRC and the CSTB characterize tech fluency in term of Fluency with Information Technology (“FITness”):

FITness entails a process of lifelong learning in which individuals continually apply what they know to adapt to change and acquire more knowledge to be more effective at applying information technology to their work and personal lives.<sup>43</sup>

Technical fluency (referred to in our report as “tech fluency”) measures the participant’s ability to understand, explain, and discuss technical tools and concepts. To evaluate tech fluency, we presented participants with the seven statements below and asked them how often each statement was true for them.

1. I would be able to read and understand HTML (Hypertext Markup Language).
2. I can easily learn new software applications.
3. I can identify between hardware and software problems.
4. I can explain how a computer operates and processes information.
5. I understand the difference between computer storage and memory.
6. I can describe how email is transmitted from one computer to another.
7. I feel comfortable and confident when trying to use new or unfamiliar programs.

For each question, participants could answer Never, Sometimes, Usually, or Always. Each answer was converted to the numeric values 1 through 4, where 1 = Never and 4 = Always.

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<sup>42</sup> The National Research Council is a part of the National Academies, which for more than 100 years have provided independent advice on issues of science, technology, and medicine that underlie many questions of national importance.

<sup>43</sup> *Being Fluent with Information Technology*, p.2

## APPENDIX B: CAT STUDY HISTORY

In 2003, MGS Consulting Services began a multi-year evaluation to assess the impact that the Community Access to Technology (CAT) program (and by extrapolation, other funders of community technology centers) in terms of both the digital divide and digital choice. Over the course of several years, this evaluation aimed to answer the following overarching questions:

- Is the CAT program having the desired impact?
- Are community technology programs successful at reaching those outside the formal education system and making a meaningful impact in people's lives?
- Are grantees able to sustain granted staff positions and projects (when intended)?
- What are the attributes of successful projects and of failed projects?
- Is the impact of the CAT program greater in priority areas (such as organizations serving youth, the disabled, and rural communities) than in non-priority areas?

Thirty-nine CAT grantee organizations participated in the third year of this evaluation effort, which is the focus of this report.

### YEAR 3 (2005) STUDY

In 2004, the CAT program learned of some interesting and potentially significant trends involving the number of developmental assets (based on research from Search Institute) that youth involved in high-quality/high-touch programs seemed to have. The purpose of the Year 3 evaluation was to explore and verify some of these findings, and to inform the Bill & Melinda Gates Foundation and the wider community technology sector about leveraged program components which lead to successful outcomes in youth community technology programs.

#### Objectives and Approach

The third year of the CAT program evaluation began with the following hypotheses related to community technology programs:

- Developmental assets increase with participation.
- Technology fluency increase with participation.
- Job skills and job readiness increase with participation.

The ultimate goal for the Year 3 evaluation was to take an in-depth look at the impact that community technology projects have on the lives of young people. There are several core questions associated with this inquiry:

- 1. Do youth participating in high-quality/high-touch programs have more developmental assets than the youth population overall? Why or why not?**

- a. Do youth participating in high-quality/high-touch programs have more assets than youth participating in lesser quality/low-touch programs? Why or why not?
2. **What are the distinguishing characteristics of high-quality/high-touch programs**, and what initial information do we have to explain the core program components that are common across programs where we see a significant increase in youths' developmental assets?
3. **What is unique about community technology youth programs** in terms of increasing youth assets (or decreasing youth risks) vs. non-technology youth programs? Are there certain important youth development benchmarks/skills/abilities that community technology programs deliver to youth to a larger degree than non- technology programs? Are community technology programs successful at making meaningful impacts in young people's technical fluency and interest in learning new technology?
  - a. Do youth report an increase in technical fluency as a result of participating in community technology programs?
  - b. Do youth specifically report an increase in confidence in troubleshooting unknown situations and a willingness to explore and learn new skills and technologies?
4. **Other than increases in developmental assets, what other demonstrable effects — in terms of social return on investment — do youth community technology programs bring to youth and their communities?** (for instance, improved grades, higher retention, graduation rates, college attendance, etc.; and reduced risk of criminal activity, substance abuse, behavioral problems, violence, etc.)

## YEAR 1 (2003) AND YEAR 2 (2004) STUDIES

The Year 1 study was designed to:

- Evaluate the accomplishments, effectiveness, and lessons learned from the CAT grantee portfolio.
- Understand how grantees measured project impact and success for their clients.

The study revealed the following:

- Most clients of CAT-sponsored projects were working on employment/economic goals and academic/literacy goals. However, a significant percentage worked on softer goals, such as personal growth and independence.
- One-fourth (25%) of grantees offered more programming than originally expected, and 31% served more people than originally expected. A smaller number of grantees reported offering fewer programs or serving fewer people.
- A full 93% of grantees have continued to operate their programs successfully and 93% have maintained CAT project staff positions.
- Staffing issues, such as handling staff and executive turnover and finding qualified staff, were reported as the major roadblocks to successfully implementing and operating projects.

Conversely, a lack of staffing-related problems was a strong predictor of a project's ability to meet or exceed service-delivery goals.

The second year's evaluation of the CAT program built upon the findings of the first year and looked at adults and youth, focusing on the following three questions:

1. Overall, what quantitative impact have the CAT program grants had in the Pacific Northwest?
2. How effective have grantee organizations been in affecting the lives of individual clients through projects supported by the Gates Foundation?
3. Are there sector-specific issues that contribute to the success of technology projects such as those that the CAT program sponsors?

The second year of the study revealed the following regarding youth:

- Youth participating in CAT-funded programs reported having a higher number of the developmental assets identified by Search Institute as being critical for youth to grow and thrive in life.
- The primary reason youth said they participated in the community technology programs was to learn computer skills. They plan to use those skills to achieve their goals, which were to 1) do better in school, 2) learn new skills or technologies, and 3) become more employable.
- Almost two-thirds (61%) of youth participants achieved their goal while in the program.

These findings related to assets, site-specific factors, and tech skills influenced the indicators and site interactions which framed the third and final year of this evaluation.

## APPENDIX C: STUDY DESIGN AND METHODOLOGY

The data collected in this evaluation process came directly from the youth participating in the technology programs and the people managing the programs. They were asked to give their opinion on various issues and skill levels and to self-report their grades. Therefore, the data is subjective and holds limited scientific or statistical validity. What it does provide, however, is an understanding of who the program participants are, how they view their participation in the programs, and what factors are seen at successful sites. The data also allows us to clearly see patterns and understand where further research is needed.

### DATA COLLECTION

We used two methods of data collection: 1) surveys completed by the youth participants at each site and 2) interviews with key program staff.

#### Surveys

MGS designed the first part of a two-part online survey using Survey Monkey (for survey questions, see Appendix F of this report). The survey was completed by youth at each of the 39 participating sites on three separate occasions (see the list of sites below). The first part of the survey asked for data regarding measurable changes in the participant's perception of employability, confidence levels, and grades. The second part of the survey was the Search Institute's Developmental Assets Profile, and consisted of forty questions with a 4-point rating scale.<sup>44</sup>

MGS staff traveled to each site and personally facilitated survey administration. If a site did not have Internet connectivity, the participants filled out paper copies of the survey and their answers were manually entered into the online form by MGS staff.<sup>45</sup>

There was a four-month (within 100-150 days) period between survey administration at each site. This time period was within the range for validity, according to the DAP guidelines. The first surveys were administered in May 2005, and the final surveys were completed by June 2006.

There were multiple reasons that would render a survey unusable for the purposes of this evaluation. Surveys were excluded when respondents were:

- Outside the age range (9-19)
- Did not indicate an age and provided no date of birth or grade with which to confirm age qualification.
- Did not answer the majority of questions.

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<sup>44</sup> "The DAP is a 58 item checklist that takes about 10 minutes to complete and is focused exclusively on assets. It is an individual measure that yields quantitative scores for asset categories and context areas portrayed in a profile format... It is designed to be sensitive to changes in reported assets over time and it is suited to research and program evaluation. The Developmental Assets Profile (DAP) is based on Search Institute 40 developmental assets framework, a strengths-based approach for promoting the healthy development of children and youth. The framework defines the relationships, opportunities, skills, and values children and adolescents need to thrive." From the *Developmental Assets Profile, Preliminary Users Manual*. January 2004.

<sup>45</sup> See Appendix F for survey questions.

- Scored too high or too low on the DAP Score.<sup>46</sup>
- Did not give his or her name.
- Completed more than one survey.

## Staff Interviews

Interviews were conducted with program managers to ascertain the key elements necessary for a successful program. They included the following topics:

- The characteristics of a high-quality technology program
- Witnessed or anticipated academic and job readiness outcomes
- Social support structures that the staff see as necessary components of a successful tech program

Thirty-two key staff members were interviewed in person by MGS staff, one small group discussion was held, and two written surveys were completed.<sup>47</sup>

## CHALLENGES RELATING TO VALIDITY AND DATA COLLECTION

MGS experienced the following challenges regarding survey validity and data collection:

- **Timing** — The first round of surveys, or “first touch,” was administrated in March and April 2005, near the end of the school year. Since the surveys were administrated approximately four months apart, the second survey (“second touch”) was given during the youths’ summer vacation. The summer populations at many of the sites are often different than school-year participants (some school year programs are suspended during the summer). These factors resulted in fewer youth being at the sites for all three surveys.

This timing may also have affected the way in which students responded to the survey questions regarding grades. Youth who filled out the survey at the end of the school year had a clearer understanding of their average grades than youth who completed the survey at the beginning of the school year.

- **Length of program** — This challenge of experimental mortality (participants who drop out of the study or program before it is complete) is a validity issue in nearly every evaluation conducted over time. The length of the programs at various sites posed a data collection challenge. Some programs were offered year round, while others lasted only four months, sometimes less. Youth participating in a four-month program may have been at the site for the first and second survey, but may have missed the third survey if their program had ended. To correct for this problem, we included results for all youth who filled out at least one survey (“all participants” data).

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<sup>46</sup> In accordance with the official Developmental Assets Profile (DAP) scoring protocol, we excluded surveys with asset scores below 20 and 55, and above as outlined in the *Developmental Assets Profile, Preliminary Users Manual*, January 2004. In addition, results do not contain any of the matched set data.

<sup>47</sup> See Appendix G for the interview outline.

- **Site staff availability** — When MGS staff could not be present, site staff were relied on to administer the online surveys and deliver the paper survey when they were used. However, staff turnover and/or full schedules made this a challenge. At some sites, new staff was present each time the survey was administered, introducing inconsistency. MGS staff did their best to work with program staff schedules and keep them informed of the evaluation process. Of the 108 dates that youth participants took this survey, six dates were administered by program staff.
- **Competing activities** — This challenge goes hand and hand with timing. Like all youth, the participants in these programs had multiple activities competing for their attention and time. If a youth had a soccer game, piano concert, after-school job, or any other conflict on the day the survey was administered, they missed the opportunity to complete one. If the youth who took the survey were less likely to be involved outside activities, this may introduce a certain bias in the data

In addition, there were multiple activities going on at the sites while the survey was being administered. Often youth would be engaged in a project, homework, or a computer game and not want to stop what they were doing to fill out the survey. MGS and program staff did their best to encourage youth to participate, but sometimes other activities (in their lives or in the labs) were more enticing.

- **Survey was not mandatory** — Youth participating in the technical programs were not required to fill out the surveys, and some chose not to. This resulted in some sites having fewer youth than they actually serve reflected in this evaluation. There is no way of knowing what responses the youth who did not participate would have given, or how the data would have been affected.
- **Survey fatigue and repeated testing** — The youth in the matched set took the same survey three separate times. While there were approximately four months between each administration of the survey, some youth in the matched set may have experienced survey fatigue. This means that, when they completed the survey for the second or third time, youth may not have closely read the survey or took the time to think through their answers. By keeping the survey short and waiting four months between each time it was administered, we tried to keep survey fatigue to a minimum.

While time between administering the survey may have helped combat survey fatigue, it opened a window for other events and influences to affect the lives of the youth. These outside influences and experiences could have resulted in the youth filling out the survey differently, leaving the impression that the program was impacting their lives when in reality other factors were at work. To minimize this interference, questions on the survey contained phrases such as, “because of my participation in this program...” These phrases were intended to encourage youth to think about changes that had occurred as a result of their participation in the tech program, not because of other factors.

- **Maturation** — Any survey administered over time, especially one that focuses on youth, will be faced with the challenge of participant maturation— that is, changes caused by youth aging, not what is being evaluated. For the matched set, nearly a year passed from the time

the youth completed the first survey to their completion of the third survey. While this is a relatively short period of time in terms of an evaluation, it is long enough for internal changes to take place. Youth are constantly learning, maturing, and likely growing in confidence. This could cause responses to change from survey to survey, regardless of what they are actually learning in the programs. To take maturation into account, we phrased survey questions in a way that would encourage the youth to focus on their experience in the tech programs.

The large sample size of 885 surveys helped to balance these validity issues, though they cannot be completely corrected for. They are important to keep in mind when analyzing the results of this evaluation.

## HOW THE DATA WILL BE USED

The data collected from this survey will benefit both the Bill & Melinda Gates Foundation and the individual CAT grantees. It will be used to create interest in and momentum for the community technology sector on the part of funders and community leaders. It will also be used as a reference for social sector stakeholders to inform their own development or as a piece of their program evaluation strategy to save time and cost.

In addition, the Bill & Melinda Gates Foundation can use the data as justification for the return on investment for the years spent administering the CAT program. Program and process improvement can be delivered to WSU, and can be leveraged for other areas of the Bill & Melinda Gates Foundation giving as well.

### Site-Specific Uses

The data collected through this evaluation will also be useful to the individual sites. Reports outlining site-specific results were distributed to each participating program. Once this evaluation is made public, each site will receive a summary report of the overall data with which they will be able to compare their individual site data. Sites can use this information:

- **To present a clear picture of who is participating in each program.** The data can help illustrate to funders, potential donors, supporters, and volunteers who is currently participating in the programs, as well as who is not. This information can be helpful when organizations attempt to target specific demographics for participation and determine where to focus marketing and outreach efforts.
- **To understand program impact.** The evaluation measured DAP scores, technical fluency, academic grades, and outlook for the future for youth participating in each individual site. These indicators can help demonstrate whether participating in a program has a positive affect on youth.
- **As a funding tool.** The data in this report can be presented to funders as evidence of each program's impact on the lives of youth. Having quantitative data to support qualitative findings and outcomes regarding each program will allow the sites to create strong funding proposals and/or reports.

The following section identifies who the participating organizations are, as well as the number of individual sites involved.

## PARTICIPATING ORGANIZATIONS

All eligible CAT grant recipients (13 organizations) serving clients between the ages of 10-21 were contacted and asked to participate in the evaluation. Of those 13, three did not participate. The following table identifies the organizations that participated:

INVITED ORGANIZATIONS	NUMBER OF PARTICIPATING SITES
Intel Computer Clubhouse	1
Lopez Island Family Resource Center	1
Technology Access Foundation (TAF)	1
Work Source/KCWTP	1
Yesler Community Center	1
YMCA Metrocenter	1
Kent Youth & Family Services	3
Stone Soup	7
4H	6
Boys & Girls Clubs of America / Washington State Boys & Girls Club Alliance	17
<b>Total</b>	<b>39</b>

## APPENDIX D: SPSS OUTPUTS

### TECH FLUENCY AND TIME IN PROGRAM

#### Correlations

		ASSETS	How long have you been participating in this technology program?
ASSETS	Pearson Correlation	1	.092**
	Sig. (2-tailed)		.009
	N	885	794
How long have you been participating in this technology program?	Pearson Correlation	.092**	1
	Sig. (2-tailed)	.009	
	N	794	794

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### TECH FLUENCY AND ASSETS

		ASSETS
ASSETS	Pearson Correlation	1
	Sig. (2-tailed)	
	N	885
I would be able to read and understand HTML (Hypertext Markup La	Pearson Correlation	.080(*)
	Sig. (2-tailed)	.022
	N	830
I can easily learn new software applications	Pearson Correlation	.086(*)
	Sig. (2-tailed)	.012
	N	857
I can identify between hardware and software problems	Pearson Correlation	.105(**)
	Sig. (2-tailed)	.002
	N	846
I can explain how a computer operates and processes information	Pearson Correlation	.087(*)
	Sig. (2-tailed)	.011
	N	849
I understand the difference between computer storage and memory	Pearson Correlation	.092(**)
	Sig. (2-tailed)	.007

	N	845
I can describe how email is transmitted from one computer to another	Pearson Correlation	.066
	Sig. (2-tailed)	.055
	N	847
I feel comfortable and confident when trying to use new or unfamiliar	Pearson Correlation	.128(**)
	Sig. (2-tailed)	.000
	N	860

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

## DEVELOPMENTAL ASSET SCORES AND TIME IN PROGRAM

### Correlations

		ASSETS	How long have you been participating in this technology program?
ASSETS	Pearson Correlation	1	.092**
	Sig. (2-tailed)		.009
	N	885	794
How long have you been participating in this technology program?	Pearson Correlation	.092**	1
	Sig. (2-tailed)	.009	
	N	794	794

\*\* Correlation is significant at the 0.01 level (2-tailed).

## DEVELOPMENTAL ASSET SCORES AND GRADES

### Correlations

		ASSETS	English	Mathematics	Science	Social Studies
ASSETS	Pearson Correlation	1	.180**	.084*	.064	.192**
	Sig. (2-tailed)		.000	.017	.074	.000
	N	885	762	795	774	768
English	Pearson Correlation	.180**	1	.364**	.360**	.534**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	762	762	746	732	724
Mathematics	Pearson Correlation	.084*	.364**	1	.448**	.369**
	Sig. (2-tailed)	.017	.000		.000	.000
	N	795	746	795	760	751
Science	Pearson Correlation	.064	.360**	.448**	1	.440**
	Sig. (2-tailed)	.074	.000	.000		.000
	N	774	732	760	774	744
Social Studies	Pearson Correlation	.192**	.534**	.369**	.440**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	768	724	751	744	768

\*\* · Correlation is significant at the 0.01 level (2-tailed).

\* · Correlation is significant at the 0.05 level (2-tailed).

# GRADES AND TECH FLUENCY

## Correlations

		English	Mathematics	Science	Social Studies	I would be able to read and understand HTML (Hypertext Markup La	I can easily learn new software applications	I can identify between hardware and software problems	I can explain how a computer operates and processes information	I understand the difference between computer storage and memory	I can describe how email is transmitted from one computer to ano	I feel comfortable and confident when trying to use new or unfam
English	Pearson Correlation	1	.364**	.360**	.534**	.100**	.057	.012	.070	.069	.054	.099**
	Sig. (2-tailed)		.000	.000	.000	.007	.117	.737	.055	.062	.142	.007
	N	762	746	732	724	725	750	740	744	737	740	749
Mathematics	Pearson Correlation	.364**	1	.448**	.369**	.057	.116**	.085*	.043	.118**	.049	.129**
	Sig. (2-tailed)	.000		.000	.000	.116	.001	.018	.236	.001	.176	.000
	N	746	795	760	751	758	785	774	778	772	775	781
Science	Pearson Correlation	.360**	.448**	1	.440**	.076*	.167**	.123**	.087*	.104**	.088*	.159**
	Sig. (2-tailed)	.000	.000		.000	.038	.000	.001	.017	.004	.015	.000
	N	732	760	774	744	738	763	755	757	752	756	762
Social Studies	Pearson Correlation	.534**	.369**	.440**	1	.176**	.124**	.139**	.140**	.163**	.106**	.195**
	Sig. (2-tailed)	.000	.000	.000		.000	.001	.000	.000	.000	.004	.000
	N	724	751	744	768	735	757	748	752	745	749	756
I would be able to read and understand HTML (Hypertext Markup La	Pearson Correlation	.100**	.057	.076*	.176**	1	.438**	.451**	.387**	.367**	.292**	.342**
	Sig. (2-tailed)	.007	.116	.038	.000		.000	.000	.000	.000	.000	.000
	N	725	758	738	735	830	821	813	813	809	810	820
I can easily learn new software applications	Pearson Correlation	.057	.116**	.167**	.124**	.438**	1	.516**	.439**	.456**	.385**	.470**
	Sig. (2-tailed)	.117	.001	.000	.001	.000		.000	.000	.000	.000	.000
	N	750	785	763	757	821	857	840	843	838	840	847
I can identify between hardware and software problems	Pearson Correlation	.012	.085*	.123**	.139**	.451**	.516**	1	.535**	.544**	.416**	.388**
	Sig. (2-tailed)	.737	.018	.001	.000	.000	.000		.000	.000	.000	.000
	N	740	774	755	748	813	840	846	834	829	830	837
I can explain how a computer operates and processes information	Pearson Correlation	.070	.043	.087*	.140**	.387**	.439**	.535**	1	.545**	.523**	.337**
	Sig. (2-tailed)	.055	.236	.017	.000	.000	.000	.000		.000	.000	.000
	N	744	778	757	752	813	843	834	849	833	836	842
I understand the difference between computer storage and memory	Pearson Correlation	.069	.118**	.104**	.163**	.367**	.456**	.544**	.545**	1	.479**	.394**
	Sig. (2-tailed)	.062	.001	.004	.000	.000	.000	.000	.000		.000	.000
	N	737	772	752	745	809	838	829	833	845	832	839
I can describe how email is transmitted from one computer to ano	Pearson Correlation	.054	.049	.088*	.106**	.292**	.385**	.416**	.523**	.479**	1	.358**
	Sig. (2-tailed)	.142	.176	.015	.004	.000	.000	.000	.000	.000		.000
	N	740	775	756	749	810	840	830	836	832	847	841
I feel comfortable and confident when trying to use new or unfam	Pearson Correlation	.099**	.129**	.159**	.195**	.342**	.470**	.388**	.337**	.394**	.358**	1
	Sig. (2-tailed)	.007	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	749	781	762	756	820	847	837	842	839	841	860

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## APPENDIX E: CHANGES IN DAP SCORES OVER TIME

The following tables illustrate the percentage of matched-set youth in each DAP group (Low, Fair, Good, and Excellent) and how they shifted from survey to survey:

### MATCHED SET WHO REPORTED **LOW** ASSET SCORES IN FIRST SURVEY (N=8)

	1ST SURVEY	2ND SURVEY	3RD SURVEY
Low	<b>100%</b>	25%	38%
Fair	0	38%	38%
Good	0	38%	25%
Excellent	0	0%	0%

### MATCHED SET WHO REPORTED **FAIR** ASSET SCORES IN FIRST SURVEY (N=24)

	1ST SURVEY	2ND SURVEY	3RD SURVEY
Low	0%	13%	13%
Fair	<b>100%</b>	46%	54%
Good	0	42%	29%
Excellent	0	0%	4%

### MATCHED SET WHO REPORTED **GOOD** ASSET SCORES IN FIRST SURVEY (N=39)

	1ST SURVEY	2ND SURVEY	3RD SURVEY
Low	0%	8%	3%
Fair	0%	15%	31%
Good	<b>100%</b>	64%	56%
Excellent	0%	13%	10%

MATCHED SET WHO REPORTED **EXCELLENT** ASSET SCORES IN FIRST SURVEY (N=12)

	1ST SURVEY	2ND SURVEY	3RD SURVEY
Low	0%	0%	0%
Fair	0%	8%	42%
Good	0%	42%	33%
Excellent	<b>100%</b>	50%	25%

# APPENDIX F: ONLINE SURVEY, PART I

Part I of the survey was created by MGS Consulting Services for all sites, excluding King County Work Training Program and YMCA sites. For details on how the survey was administered, see Appendix C of this report.

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## 1. Community Technology Youth Survey

We hope that you have enjoyed coming to this technology center! You can help make the program better by telling us what you think!

We want to know how your experiences here help you in your life so we will be giving you this survey every three months for one year.

Your responses will be combined with comments from everyone else without any names. Your name will never be revealed or released.

Your opinion makes a difference. Thank you for your help!

---

### 1. First Name (your answers will always remain anonymous)

### 2. Last Name (your answers will always remain anonymous)

### 3. How long have you been participating in this technology program?

### 4. Over the past 3 months, about how many hours per week do you spend participating in this program?

1-2 hours

3-4 hours

5-8 hours

9 or more hours



### 5. What skills have you learned in this program?

**6. Describe your experience learning these new skills in this program.**

- I already had these skills.
- These are skills that I cannot learn elsewhere.
- I learn the same skills at school.
- I am not learning any skills.

**7. How will these skills help you in the future? (Please check all that apply.)**

- Graduate from school or go to college
- Improve my English
- Get a good job
- Do better in school
- Get along better with family, friends and others
- Be a leader
- Help others
- Help me become independent
- Help me make friends and fit in
- Make better choices
- Have a better life
- Make me a better person
- Other (please specify)

**8. Below, check the one that is most important to you.**

- Graduate from school or go to college
- Improve my English
- Get a good job

- Do better in school
  - Get along better with family, friends and others
  - Be a leader
  - Help others
  - Help me become independent
  - Help me make friends and fit in
  - Make better choices
  - Have a better life
  - Make me a better person
  - Other (please specify)
- 

**9. Over the past 3 months, how has your participation in this program improved your ability to do well in school?**

<input type="radio"/>	Helped a lot
<input type="radio"/>	Helped a little
<input type="radio"/>	Didn't help
<input type="radio"/>	Don't know yet
<input type="radio"/>	No longer in school

**10. Over the past 3 months, mark the statement that best describes your grades for each of the school subjects.**

	Mostly A's (90-100)	Mostly B's (80-89)	Mostly C's (70-79)	Mostly D's (60-69)	Mostly below D (below 60)	Not applicable
English	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mathematics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Science	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Social Studies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**11. For each sentence below, check if you agree or disagree.**

**"Because of my participation in this program I am hopeful that..."**

	Agree	Disagree	N/A
...I will do better in school	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
...I will improve my study skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...I will one day finish high school	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
...I will one day get a good job when I am done with school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...I will one day go to college	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

**12. What type of job do you see yourself in after you have completed all of your schooling?**

- Professional in computer or math related job (example: Developer, engineer)
- Healthcare practitioner (example: Doctor, physical therapist, nurse)
- Teacher or Professor (in grade school, high school or college)
- Technical skills worker (example: Lab technician, computer network administrator)
- Service occupations. (example: Waiter/waitress, nurse's aide, store clerk)
- Construction and trade occupations. (example: Builder, electrician, iron worker)
- Sales and related occupations. (example: store salespersons, cashier)
- Office and administrative support occupations. (example: Customer service representatives, desktop publishers)

- Production occupations. (example: Machinists, welder)
- Other (please specify)

**13. Are the skills you've learned in the past 3 months helping you prepare for the job you want?**

<input type="radio"/>	Yes
<input type="radio"/>	No

**14. In the past 3 months, what has been most useful for you in this program to help you prepare for the job you want?**

**15. Do you have a computer at home that you use?**

- Yes
- No

**16. Rate your skill level for each sentence.**

	Never	Sometimes	Usually	Always
I would be able to read and understand HTML (Hypertext Markup Language) if I had a reference.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can easily learn new software applications.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can identify between hardware and software problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can explain how a computer operates and processes information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I understand the difference between computer storage and memory.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can describe how email is transmitted from one computer to another.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable and confident when trying to use new or unfamiliar technologies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**17. How has participating in this computer and technology program made your life better or different?**

## APPENDIX G: PROGRAM MANAGER/KEY STAFF INTERVIEW QUESTIONS

1. What is your idea of a high-quality technology program?
2. What are outcomes that students see when they participate in high-quality technology programs?
3. What is different in kids' lives when they participate in or complete a high-quality technology program?
4. How do you build a high-quality technology program?
5. Current program description:
  - a. Curriculum
  - b. Schedule
  - c. Size
  - d. Other
6. What is the ratio of structured to free time?
7. What results have you seen?
8. What are the requirements for being allowed to participate in lab/program?
9. What are the consequences for breaking those rules?
10. Does it cost money to participate in the program?
11. Is parental requirement required? Allowed?
12. What are the main challenges you face when trying to create these conditions?
13. Any other thoughts you have that you want to share?