

Evaluation of 2006 Camp Success Program Implementation

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Evaluation of 2006 Camp Success Program Implementation

Introduction

The purpose of this report is to summarize results from the evaluation of two Camp success programs implemented in 2006. Data were collected at the program implementation sites at the beginning and conclusion of the week-long programs. The data collection instruments were modeled after those used by a similar program, Camp Reach, at WPI in Worcester, Mass. Dr. Gregory Hawkins, National Director for Evaluation, Research, and Resource Development for Nonprofit Performance Solutions, performed the data analysis for this evaluation. Dr. Hawkins was not involved in the development or application of the evaluation tools.

Executive Summary

During the summer of 2006, two Camp Success programs were conducted. The program implemented in Columbia, South Carolina, was attended by 28 youth, and the program implemented in Orangeburg, South Carolina, was attended by 20 youth. On the first day of the camp, parents or guardians and youth completed pre-program surveys. Youth participants and parents or guardians also completed post-program evaluation surveys at the conclusion of camp programming.

Data Collection and Analyses Methodology

The collection of pre- and post-program data provides an opportunity to perform both summative and formative evaluation. The summative evaluation efforts focus on program impacts on youth and families, and the data are representative of two perspectives – that of youth participants and that of parents or guardians. For summative evaluation items, descriptive statistics and measures of statistical significance (Independent Samples T-Tests, Paired Samples T-Tests) are used. The measures of statistical significance are applied to measure the difference between pre-and post-program responses, which represent possible impacts or “change” associated with program participation. The formative evaluation efforts focus on youth and parent or guardian perceptions and satisfaction with camp activities. For these evaluation items, simple descriptive statistics are used to indicate general response patterns.

Key Findings:

A camp roster of less than 30 makes a very small sample size, requiring a great deal of variance between pre-and post-program responses to register a difference that is statistically significant. However, the analyses showed the following were key impacts of the Camp Success program.

- Camp Success significantly increased youth participant’s beliefs that they understand engineering.
- Camp Success did not appear to impact youth participant motivation toward education and career development.
- Camp Success positively impacted youth participant confidence that they are capable of attaining engineering careers, although not to a level of statistical significance.

- Camp Success significantly impacted youth participants' self perceptions of a range of skills and abilities. At the Columbia site, those skills and abilities were “Making Oral Presentations”, “Relating to People Different than Me”, “Recording Information”, and “Writing Reports”. The skills and abilities youth participants felt they improved at the Orangeburg site were “Ability to Organize Information”, “Understanding the Way Things Work”, and “Using Tools”.
- Camp Success improved youth participant's self esteem at the Columbia site and at Orangeburg, students reported slight to modest improvement in most of the qualities used to measure how they felt about themselves but none to the level of statistical significance.
- Camp Success significantly improved parent/guardian beliefs that they understand engineering and engineering careers at the Orangeburg site. At the Columbia site, parents/guardians reported slightly improved understanding of engineering and engineering careers, although the difference was not statistically significant.
- Youth participants indicated The Leadership/Team Building Ropes course was the most enjoyable activity of camp. They also rated the Ice Cream Sundae Building icebreaker activity as highly enjoyable but with little educational value. The Widget Factory Simulation was generally regarded as being among the least enjoyable of the workshops or activities, although participants appeared to value it as a learning experience.
- The Design Project experience appears to be both enjoyable and education for youth participants, and is perceived by the youth as a valuable service to “real world” clients.
- Youth participants at both sites reported high levels of overall satisfaction with the Camp Success experience.

Conclusions

Formative and summative evaluation results clearly suggest that the Camp Success program, as implemented at the Columbia and Orangeburg sites in 2006, was very effective. Youth participants universally rated the program highly as both enjoyable and educationally valuable.

Camp Success shows positive and statistically significant impacts on youth participant understanding of engineering, and has a meaningful impact on youth confidence that careers in engineering are achievable. Several skills and abilities are effectively exercised during the camp experience, and youth confidence and self efficacy appear to be positively impacted.

At the Orangeburg program site parent/guardian beliefs that they understand engineering and engineering careers significantly improved. At the Columbia program site, parents/guardians reported slightly improved understanding of engineering and engineering careers, although the difference was not statistically significant.

Youth participants indicated the Leadership/Team Building Ropes course was the most enjoyable activity of camp. They also rated the Ice Cream Sundae Building icebreaker as highly enjoyable but with little educational value. The Widget Factory Simulation was generally regarded as being among the least enjoyable of the workshops or activities, although participants appeared to value it as a learning experience. The Design Project experience appears to be both enjoyable and education for youth participants, and was perceived by youth as a valuable service to “real world” clients. Youth participants at both sides reported high levels of overall satisfaction with the Camp Success experience.

The remainder of this report provides an overview of summative evaluation results addressing program impacts as assessed from the perspectives of youth and from the perspective of parent or guardians as well as formative evaluation results addressing program activities and workshops from the perspectives of youth participants.

Summative Evaluation: Youth Participant Perspectives

The summative evaluation is intended to identify possible program impacts on Camp Success youth participants. Youth participant pre-and post-program evaluation data are compared in three primary areas:

- Interest In and Knowledge of Engineering
- Motivation Toward Education and Career Development
- Confidence, Efficacy and Self-Esteem

Interest in and Knowledge of Engineering

“Interest in and Knowledge of Engineering” was measured using two Likert-type scaled items. Youth participants responded to the statement “I find engineering and technology to be interesting” and “I have a good understanding of what engineering is” by indicating their level of agreement. The level of agreement responses in the Likert-type scale were coded with the following values:

- Strongly Disagree = 1
- Disagree = 2
- Neutral/Don’t Know = 3
- Agree = 4
- Strongly Agree = 5

The evaluation data indicate that youth participants at both the Columbia and Orangeburg sites entered the Camp Success program with established interests in engineering and technology. On the five-point Likert-type scale, the youth at the Columbia program site reported an average of 4.41 and the Orangeburg youth reported an average of 4.38, indicating high level agreement with the statement “I find engineering and technology to be interesting” on the pre-program survey. At both program sites, youth reported slightly higher levels of agreement on average with the statement (Columbia = 4.4, Orangeburg = 4.5) on the post-program survey, but the difference or increases were not statistically significant.

Likewise, the data indicate that youth participants at both the Columbia and Orangeburg sites entered the Camp Success program believing that they had good understanding of engineering. On the five-point Likert-type scale, the youth at the Columbia program site reported an average of 3.82 and the Orangeburg youth reported an average of 4.00, indicating agreement with the statement “I have a good understanding of what engineering is” on the pre-program survey. At the Columbia program site, the youth participants reported significantly higher average post-program understanding of engineering (4.29). Youth participants at the Orangeburg site reported a substantial increase in average post-program understanding of engineering, although the difference was not statically significant.

Results from the evaluation of program impacts on youth participant interest in and knowledge of engineering are presented below in Table 1.

Table 1. Evaluation Results: Interest in and Knowledge of Engineering

Program Site	Evaluation Item	Pre-Program Average	Post-Program Average	Difference	2-Tailed Significance ¹
Columbia, SC Sample = 27	I find engineering and technology to be interesting	4.41	4.44	+0.03	0.83
Orangeburg, SC Sample - 16	I find engineering and technology to be interesting	4.38	4.50	+0.12	0.58
Columbia, SC Sample = 28	I have a good understanding of what engineering is.	3.82	4.29	+0.47	0.01*
Orangeburg, SC Sample - 16	I have a good understanding of what engineering is.	4.00	4.53	+0.53	0.07

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

In addition to the use of scaled item assessment to identify program impacts on youth knowledge of engineering, a nonparametric test of change in definitions of engineering was performed. Paired comparisons of youth pre- and post-program definitions of engineering were performed to identify possible changes, specifically increased sophistication of definitions including mention of engineering as a ‘helping profession,’ mention of engineering as “problem solving,” and mention of engineering as “creating, building, or designing.” It was anticipated that post-program responses would more frequently include reference to these three aspects of the engineering profession.

For analyses purposes, “no change” was defined as mention or failure to mention the engineering aspect in both the pre- and post-program responses. “Negative change” was defined as mention of the engineering aspect in the pre-program response, but failure to mention the aspect in the post-program response. “Positive change” was defined as failure to mention the engineering aspect in the pre-program response but mention of the aspect in the post-program response.

Youth definitions, although generally more detailed, did not display significant changes or incorporation of new or different aspects of the engineering profession. Typically youth appeared inclined to further expand upon their previous understanding and definitions of the engineering profession (Tables 2 – 4).

Table 2 Change in Youth Definitions of Engineering: Mention of Engineering as a Helping Profession

Program Site	No Change (%)	Negative Change (%)	Positive Change (%)
Columbia, SC Sample = 23	21 (91.3%)	0 (0%)	2 (8.7%)
Orangeburg, SC Sample = 15	14 (93.3%)	0 (0%)	1 (6.7%)

Table 3 Change in Youth Definitions of Engineering: Mention of Engineering Problem Solving

Program Site	No Change (%)	Negative Change (%)	Positive Change (%)
Columbia, SC Sample = 23	19 (82.6%)	1 (4.3%)	3 (13.0%)
Orangeburg, SC Sample = 15	11 (73.3%)	1 (6.7%)	3 (20.0%)

Table 4 Change in Youth Definitions of Engineering: Mention of Engineering as Creating, Building, and Designing

Program Site	No Change (%)	Negative Change (%)	Positive Change (%)
Columbia, SC Sample = 23	15 (65.2%)	4 (17.4%)	4 (17.4%)
Orangeburg, SC Sample = 15	10 (66.7%)	3 (20.0%)	2 (13.3%)

SUMMARY: *The Camp Success program appears to have significantly increased youth participant belief that they understand engineering. Although paired comparisons of youth participant pre- and post-program definitions of engineering do not display significant incorporation of new or different aspects of the engineering profession, they generally appear to be more detailed descriptions of previously conceived aspects of the profession.*

Motivation Toward Education and Career Development

“Motivation Toward Education and Career Development” was also measured using two Likert-type scaled items. Youth participants responded to the statements “I am looking forward to math and science courses in middle school (junior high) and high school” and “I have given a lot of thought to my future career” by indicating their level of agreement. The level of agreement responses in the Likert-type scale were coded with the following values:

- Strongly Disagree = 1
- Disagree = 2
- Neutral/Don’t Know = 3
- Agree = 4
- Strongly Agree = 5

Youth participants at both the Columbia and Orangeburg sites apparently entered the “Camp Success program looking forward to math and science courses at the junior high and high school levels. On the five-point Likert-type scale, the youth at the Columbia program site reported an average of 4.11 and the Orangeburg youth reported an average of 3.94, indicating agreement with the statement “I am looking forward to math and science courses in middle school (junior high) and high school” on the pre-program survey. Little change in attitude was indicated on the post-program surveys. Youth participants at the Columbia site reported a slightly lower average level of agreement with the statement on the post-program survey (4.07), while the Orangeburg youth participants reported a slightly higher average level of agreement with the statement (3.95). The differences between pre- and post-program responses were not statistically significant at either site.

The evaluation data indicate that youth participants at both the Columbia and Orangeburg sites entered the Camp Success program believing that they had given much thought to their future careers. On the five-point Likert-type scale, the youth at the Columbia program site reported an average of 4.29 and the Orangeburg youth reported an average of 4.38, indicating moderate to high level agreement with the statement “I have given a lot of thought to my future career” on the pre-program survey. Youth participants at the Columbia program site reported no change in average post-program responses (4.29), while youth participants at the Orangeburg site reported a slight decrease in average post-program responses (4.32), although the decrease was not statistically significant.

Results from the evaluation of program impacts on youth motivation toward education and career development are presented below in Table 5.

Table 5 Evaluation Results: Motivation Toward Education and Career Development

Program Site	Evaluation Item	Pre-Program Average	Post-Program Average	Difference	2-Tailed Significance ¹
Columbia, SC Sample = 28	I am looking forward to math and science courses in middle school (junior high) and high school.	4.11	4.07	-0.04	0.90
Orangeburg, SC Sample - 16	I am looking forward to math and science courses in middle school (junior high) and high school.	3.94	3.95	+0.01	0.98
Columbia, SC Sample = 28	I've given a lot of thought to my future career.	4.29	4.29	0.00	1.00
Orangeburg, SC Sample - 16	I've given a lot of thought to my future career.	4.38	4.32	-0.06	0.87

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

SUMMARY: *The Camp Success program does not appear to have impacted youth participant motivation toward education and career development.*

Confidence, Efficacy, and Self-Esteem

“Confidence” was measured using a single Likert-type scaled item. Youth participants responded to the statement “I could be an engineer if I wanted to” by indicating their level of agreement. The level of agreement responses in the Likert-type scale were coded with the following values:

- Strongly Disagree = 1
- Disagree = 2
- Neutral/Don’t Know = 3
- Agree = 4
- Strongly Agree = 5

Youth participants at both the Columbia and Orangeburg sites, on average, apparently entered the Camp Success program with confidence that they were capable of attaining

careers in engineering. On the five-point Likert-type scale, the youth at the Columbia program site reported an average of 4.21 and the Orangeburg youth reported an average of 3.94, indicating agreement with the statement “I could be an engineer if I wanted to” on the pre-program survey. Little change in attitude was indicated on the post-program surveys. Average youth participant responses at both sites increased on the post-program survey (Columbia = 4.54, Orangeburg = 4.26). Although the post-program averages at both sites were substantially higher, they were not statistically greater than the pre-program average survey responses. Results from the evaluation of program impacts on youth confidence are presented below in Table 6.

Table 6 Evaluation Results: Confidence

Program Site	Evaluation Item	Pre-Program Average	Post-Program Average	Difference	2-Tailed Significance ¹
Columbia, SC Sample = 28	I could be an engineer if I wanted to	4.21	4.54	+0.33	0.09
Orangeburg, SC Sample - 16	I could be an engineer if I wanted to	3.94	4.26	+0.32	0.39

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

SUMMARY: *The Camp Success program appears to have impacted youth participant confidence that they are capable of attaining engineering careers, although not to a level of statistical significance.*

“Efficacy” was measured using youth participant rating of their comfort and confidence level with 22 skill and ability Likert-type scaled items. Youth participants indicated their perceived comfort and confidence level with each skill and ability item with a response range from “poor” to “excellent.” Youth participant responses in the Likert-type scale were coded with the following values:

- Poor = 1
- Fair = 2
- Good = 3
- Excellent = 4

Youth participants at the Columbia site, on average, reported increases in skills and abilities efficacy on 21 of the 22 items, substantial increases ($\geq +0.20$) on 15 of the 22 items, and

statistically significant increases in skills and abilities efficacy on four items. The skills and abilities showing statistically significant increases from pre-program to post-program response averages at the Columbia site are “making oral presentations,” “relating to people different than me,” “recording information,” and “writing reports.” When skills and abilities are combined, that is, pre- and post-program averages across all skills and abilities are compared, post-program average scores are statistically higher. This indicates that the Camp Success program apparently had a significant and positive impact on youth participant efficacy at the Columbia site.

Results from the evaluation of program impact on youth comfort and confidence with specific skills and abilities at the Columbia program site are presented below in Table 7.

SUMMARY: *The Camp Success program, as implemented at the Columbia site, appears to have substantially and significantly impacted youth participant self-perceptions of a range of skills and abilities.*

Table 7 Evaluation Results: Efficacy, Columbia Program Site

Program Site	Skill/Ability	Pre-Program Average	Post-Program Average	Difference	2-Tailed Significance ¹
Columbia, SC Sample = 28	Building Things	3.18	3.43	+0.25	0.21
	Taking Things Apart	3.61	3.61	0.00	1.00
	Making Decisions	3.36	3.50	+0.14	0.40
	Making Measurements	3.04	3.36	+0.32	0.13
	Working with Computers	3.56	3.79	+0.23	0.16
	Making Oral Presentations	2.93	3.50	+0.57	0.01*
	Problem Solving	3.30	3.46	+0.16	0.27
	Relating to People Different than Me	3.31	3.64	+0.33	0.03*
	Working with Others	3.61	3.71	+0.10	0.44
	Observation Skills	3.29	3.50	+0.21	0.18
	Ability to Organize Information	3.18	3.52	+0.34	0.12
	Listening	3.39	3.59	+0.20	0.25
	Following Directions	3.61	3.70	+0.09	0.46
	Recording Information	3.04	3.56	+0.52	0.01*
	Research Skills	3.25	3.48	+0.23	0.27
	Writing Reports	2.93	3.41	+0.48	0.03*
	Understanding the Way Things Work	3.30	3.52	+0.22	0.18
	Using Tools	3.43	3.74	+0.31	0.07
	Planning a Schedule	3.21	3.30	+0.09	0.70
	Talking with Someone I Don't Know on the Phone	2.61	3.07	+0.46	0.09
	Conducting an Interview	2.86	3.22	+0.36	0.10
	Making New Friends	3.54	3.70	+0.16	0.27
OVERALL	3.23	3.51	+0.28	0.02	

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

Youth participants at the Orangeburg site, on average, reported increases in skills and abilities efficacy on 21 of the 22 items, substantial increases ($\geq +0.20$) on 15 of the 22 items, and statistically significant increases in skills and abilities efficacy on three items. The skills and abilities showing statistically significant increases from pre-program to post-program response averages at the Orangeburg site are “ability to organize information,” “understanding the way things work,” and “using tools.” When pre-and post-program averages across all skills and abilities are compared, no statistically significant difference is observed.

Results from the evaluation of program impact on youth comfort and confidence with specific skills and abilities at the Orangeburg program site are presented below in Table 8.

SUMMARY: *The Camp Success program, as implemented at the Orangeburg site, appears to have substantially impacted youth participant self-perceptions of a range of skills and abilities, although only a few were impacted in a statistically significant manner. However, the lack of statistically significant differences between pre- and post-program measurements across all skills and abilities is a function, in part, of the relatively small sample size.*

Table 8 Evaluation Results: Efficacy, Orangeburg Program Site

Program Site	Skill/Ability	Pre-Program Average	Post-Program Average	Difference	2-Tailed Significance ¹
Orangeburg, SC Sample = 17	Building Things	3.24	3.60	+0.36	0.07
	Taking Things Apart	3.47	3.40	-0.07	0.78
	Making Decisions	3.24	3.50	+0.26	0.32
	Making Measurements	3.06	3.32	+0.26	0.28
	Working with Computers	3.41	3.70	+0.29	0.18
	Making Oral Presentations	3.19	3.40	+0.21	0.38
	Problem Solving	3.19	3.60	+0.41	0.08
	Relating to People Different than Me	3.41	3.60	+0.19	0.39
	Working with Others	3.71	3.75	+0.04	0.77
	Observation Skills	3.41	3.60	+0.19	0.31
	Ability to Organize Information	3.06	3.60	+0.54	0.05*
	Listening	3.53	3.58	+0.05	0.80
	Following Directions	3.53	3.70	+0.17	0.35
	Recording Information	3.18	3.58	+0.40	0.10
	Research Skills	3.35	3.47	+0.12	0.63
	Writing Reports	2.93	3.37	+0.43	0.10
	Understanding the Way Things Work	3.18	3.58	+0.40	0.04*
	Using Tools	3.35	3.74	+0.39	0.05*
	Planning a Schedule	2.94	3.32	+0.38	0.16
	Talking with Someone I Don't Know on the Phone	3.00	3.32	+0.32	0.38
	Conducting an Interview	2.88	3.21	+0.33	0.26
	Making New Friends	3.59	3.84	+0.25	0.22
	OVERALL	3.30	3.56	+0.26	0.10

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

“Self-Esteem” was measured using 11 paired descriptors preceded by the question “How do you feel about yourself?” For example, paired descriptors included “Weak – Powerful,” and youth participants indicated their self-perception as either “very weak,” “only a bit weak,” “in between,” “only a bit powerful,” or “very powerful.” Five of the scale items were reverse coded. For the least desirable self-perception to the most desirable, youth participant responses were coded with the following values:

- “Very (least desirable)” = 1
- “Only a Bit (least desirable)” = 2
- “In Between” = 3
- “Only a Bit (most desirable)” = 4
- “Very (most desirable)” = 5

Comparison of the pre-and post-program evaluation data reveals that youth participants at the Columbia site, on average, reported improved self-perception (“How do you feel about yourself?”) on 10 of the 11 items, and statistically significant increases on one item. The self-esteem item showing statistically significant increases from pre-program to post-program response averages at the Columbia site is “believability.” Likewise, the desire to feel (“How you would like to be”) “in control” was, on average, statistically higher among post-program responses than the pre-program responses.

Though lacking statistical significance, several items showed substantial increases in average response scores from pre- to post-program. This net effect is apparent when examining the “overall” average scores across items. The post-program response average across all self-esteem items, in reference to the question “How do you feel about yourself?,” is statistically higher than the pre-program response average, indicating that, in general, youth participants perceived themselves in a significantly more positive manner.

Results from the evaluation of program impacts on youth participant self-esteem at the Columbia program site are presented below in Table 9.

SUMMARY: *The Camp Success program, as implemented at the Columbia site, appears to have substantially and significantly impacted youth participant self-efficacy.*

Table 9 Evaluation Results; Self Esteem, Columbia Program Site.

Program Site	Characteristic	Pre-program Average (Am NOW, Want to BE)	Post-Program Average (Am NOW, Want to BE)	Average Difference (Am NOW, Want to BE)	2-Tailed Significance ¹ (Am NOW, Want to BE)
Columbia, SC Sample = 25	Smart	4.84, 4.96	4.74, 5.00	-0.10, +0.04	0.58, 0.30
	Powerful	3.96, 4.72	4.37, 4.63	+0.41, -0.09	0.16, 0.67
	Believable	4.32 , 4.80	4.81 , 4.96	+0.49 , +0.16	0.02* , 0.32
	Careful	3.84, 4.64	4.33, 4.70	+0.49, +0.06	0.13, 0.81
	Liked	4.48, 4.92	4.59, 4.93	+0.11, +0.01	0.66, 0.95
	Funny	4.16, 4.60	4.22, 4.67	+0.06, +0.07	0.77, 0.76
	Neat	3.60, 4.76	4.22, 4.81	+0.62, +0.05	0.10, 0.81
	Decisive	3.91, 4.44	4.37, 4.81	+0.46, +0.37	0.11, 0.15
	Friendly	4.80, 5.00	4.93, 4.96	+0.13, -0.04	0.45, 0.34
	Good Team Member	4.76, 5.00	4.78, 4.93	+0.02, -0.07	0.92, 0.34
	In Control	3.96, 4.28	4.41, 4.96	+0.45, +0.68	0.13, 0.01*
	OVERALL	4.26 , 4.74	4.74 , 4.85	+0.48 , +0.11	0.05* , 0.28

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

Comparison of the pre-and post-program evaluation data reveals that youth participants at the Orangeburg site, on average, reported slight to modest improved self perception (“How do you feel about yourself?”) on 8 of the 11 items, although none of these increased average scores were statistically significant. Results from the evaluation of program impacts on youth participant self-esteem at the Orangeburg program site are presented below in Table 10.

SUMMARY: *The Camp Success program, as implemented at the Orangeburg site, appears to have had only slight to modest effect on youth participant self-efficacy.*

Table 10 Evaluation Results; Self-Esteem, Orangeburg Program Site.

Program Site	Characteristic	Pre-program Average (Am NOW, Want to BE)	Post-Program Average (Am NOW, Want to BE)	Average Difference (Am NOW, Want to BE)	2-Tailed Significance ¹ (Am NOW, Want to BE)
Orangeburg, SC Sample = 17	Smart	4.88, 5.00	4.80 5.00	-0.08, 0.00	0.58, 1.00
	Powerful	4.24, 4.93	4.60, 5.00	+0.36, +0.07	0.15, 0.25
	Believable	4.65, 4.87	4.75, 5.00	+0.10, +0.13	0.73, 0.25
	Careful	3.81, 4.67	4.10, 4.85	+0.29, +0.19	0.52, 0.41
	Liked	4.76, 5.00	4.85, 4.95	+0.09, -0.05	0.66, 0.39
	Funny	3.88, 4.47	4.45, 4.65	+0.57, +0.18	0.15, 0.62
	Neat	4.31, 4.73	4.40, 4.95	+0.09, +0.22	0.75, 0.27
	Decisive	3.94, 5.00	4.25, 4.95	+0.31, -0.05	0.46, 0.39
	Friendly	4.71, 4.73	4.85, 5.00	+0.14, +0.27	0.55, 0.14
	Good Team Member	4.94, 5.00	4.80, 5.00	-0.14, 0.00	0.31, 1.00
	In Control	4.41, 4.60	4.40, 4.80	-0.01, +0.20	0.98, 0.56
	OVERALL	4.37, 4.82	4.57, 4.93	+0.20, +0.10	0.20, 0.15

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

When comparing the two program implementation sites on the self-esteem outcomes, it appears that the Columbia implementation may have been more effective in this regard. However, the Orangeburg site provided a somewhat smaller sample which impacts the ability to discern program impacts of statistical significance.

Summative Evaluation: Parent or Guardian Perspectives

In addition to program impacts evaluated from the perspective of the youth participants, pre- and post-program assessment data were provided by parents or guardians. Youth participant pre- and post-program assessments by parents or guardians are compared in five primary areas:

- Self Confidence
- Interest in and Knowledge of Engineering
- Motivation Toward Education and Career Development
- Ability to Work with Others
- Interpersonal Communication Skills

Parents or guardians completed pre- and post-program assessments of their child's attitudes and abilities with regards to self confidence, motivation toward education, learning and achievement, ability to work with others, interest in engineering, science and technology, and interpersonal communication skills. The response scale for the parent or guardian assessments of youth participant attitudes and abilities used the following values:

- Very Low = 1
- Somewhat Low = 2
- Average = 3
- Moderately High = 4
- Very High = 5

The evaluation data indicate that parents or guardians perceived their children as possessing moderately high to very high levels of abilities and attitudes in relation to the measured items at the onset of the program. On the five-point scale, the youth at the Columbia program site were rated by their parents or guardians, on average, with attitudes and abilities between moderately high and very high (4.07). Likewise, parents or guardians of the Orangeburg youth reported an average attitude and abilities rating of 4.16.

At both program sites, parents or guardians reported slightly to moderately higher average abilities and attitude ratings on the post-program assessments (Columbia = 4.22, Orangeburg = 4.39), but the differences or increases were not statistically significant. Results from the evaluation of program impacts on youth participant interest in and knowledge of engineering as perceived by parents or guardians are presented below in Table 11.

Table 11 Evaluation Results: Parent or Guardian Perspectives

Program Site	Evaluation Item	Pre-Program Average	Post-Program Average	Difference	2-Tailed Significance¹
Columbia, SC Sample = 21	Self-Confidence	3.93	4.24	+0.31	0.21
Orangeburg, SC Sample = 16	Self-Confidence	3.88	4.37	+0.49	0.15
Columbia, SC Sample = 21	Motivation Toward Education, Learning and Achievement	4.19	4.29	+0.10	0.62
Orangeburg, SC Sample = 16	Motivation Toward Education, Learning and Achievement	4.38	4.47	+0.09	0.74
Columbia, SC Sample = 21	Ability to Work with Others	4.27	4.24	-0.03	0.91
Orangeburg, SC Sample = 16	Ability to Work with Others	4.31	4.37	+0.06	0.85
Columbia, SC Sample = 21	Interest in Engineering, Science and Technology	4.22	4.33	+0.11	0.61
Orangeburg, SC Sample = 16	Interest in Engineering, Science and Technology	4.13	4.26	+0.13	0.70
Columbia, SC Sample = 21	Interpersonal Communication Skills	3.74	4.00	+0.26	0.35
Orangeburg, SC Sample = 16	Interpersonal Communication Skills	4.00	4.47	+0.47	0.22
Columbia, SC Sample = 21	OVERALL	4.07	4.22	+0.15	0.35
Orangeburg, SC Sample = 16	OVERALL	4.16	4.39	+0.23	0.43

¹Significance levels ≤ 0.05 represent statistically significant difference between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance.

Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlighting and an asterisk (*).

SUMMARY: *The Camp Success program, as implemented at the Columbia and Orangeburg sites, appears to have had only slight to modest effect on youth participant abilities and attitudes, as rated by parents or guardians. It is also worth noting that different parents or guardians provided pre-and post-program ratings in some cases. The use of different raters may compromise the ability to determine program related impacts, due to variance in the perspectives of the two raters.*

Summative Evaluation: Effects on Families

The “effect on families” was measured using a single Likert-type scaled item. Parents or guardians responded to the statement “I / we have a good understanding of engineering and engineering careers” by indicating their level of agreement. The level of agreement responses in the Likert-type scale were coded with the following values:

- “ Strongly Disagree = 1
- “ Disagree = 2
- “ Neutral / Don’t Know = 3
- “ Agree = 4
- “ Strongly Agree = 5

The parents and guardians at the Orangeburg site displayed significant gain in the average score on the item addressing understanding of engineering and engineering careers. On the five-point Likert-type scale, parents and guardians at the Orangeburg program site reported an average of 3.50 on the pre-program assessment, compared to 4.21 on the post-program assessment. This represents a statistically significant improvement in average response. There was a slight increase in average response on the post-program assessment at the Columbia program site, but the difference was not statistically significant. Results from the evaluation of program impacts on parent or guardian understanding of engineering and engineering careers are presented below in Table 12.

Table 12 Evaluation Results: Effects on Families

Program Site	Evaluation Item	Pre-Program Average	Post-Program Average	Difference	2-Tailed Significance ¹
Columbia, SC Sample = 21	I/we have a good understanding of engineering and engineering careers	3.64	3.90	+0.26	0.32
Orangeburg, SC Sample - 16	I/we have a good understanding of engineering and engineering careers	3.50	4.21	+0.71	0.03*

¹. Significance levels ≤ 0.05 represent statistically significant differences between pre- and post-program average item scores. Statistical significance is a function of sample size and variation among responses, so raw “difference” scores alone are not sufficient to determine levels of significance. Larger sample size results in lower “difference” scores needed to determine statistical significance of differences. Statistically significant items are indicated by yellow highlight and an asterisk (*).

SUMMARY: *The Camp Success program appears to have significantly improved parent and guardian beliefs that they understand engineering and engineering careers at the Orangeburg program site. At the Columbia site, parents and guardians reported slightly improved understanding of engineering and engineering careers, although the difference was not statistically significant.*

Formative Evaluation: Participant Experience Assessments

The formative evaluation is intended to provide feedback on the program implementation from youth participants. Post-program evaluation data from youth participants are summarized below, addressing the following topics:

- Enjoyment of and Learning From Workshops and Activities
- Reactions to the Design Project Experience
- Measures of Overall Satisfaction

Enjoyment of and Learning from Workshops and Activities

All workshops and activities were evaluated by the youth participants along two dimensions. First, youth participants were asked to indicate their level of agreement with the statement, “I **enjoyed** this workshop or activity.” Second, youth participants were asked to indicate their level of agreement with the statement, “I **learned a lot** from this workshop or activity.” The level of agreement responses in the Likert-type scale were coded with the following values:

- Strongly Disagree = 1
- Disagree = 2
- Neutral / Don’t Know = 3
- Agree = 4
- Strongly Agree = 5

The youth participants at the Columbia program site, on average, reported enjoying the Wacky Shoes (4.46), Ice Cream Sundae Building (4.43) and Leadership / Team Building Ropes Course (4.43) activities or workshops the most. The workshops or activities enjoyed the least at the Columbia program site, on average, were the Widget Factory Simulation (3.50) and the Un-Celebration Party Design (3.71).

At the Orangeburg program site, the youth participants reported most enjoying the Ice Cream Sundae Building (4.68) and the Leadership / Team Building Ropes Course workshops or activities, on average. The Allied Field Trip (4.11) and the Widget Factory Simulation (4.15) workshops or activities were reported to be the least enjoyable.

The Columbia youth participants reported, on average, learning the most from the Wacky Shoes (4.32) and Bose Field Trip (4.26) activities or workshops. The workshops or activities from which they reported learning the least, on average, were the Un-Celebration Party Design (3.82) and the Ice Cream Sundae Building (3.86).

The youth participants at the Orangeburg program site, on average, reported learning the most from the Widget Factory Simulation (4.63) and the Wacky Shoes (4.45) activities or workshops. The workshops or activities from which they reported learning the least, on average, were the Ice Cream Sundae Building (3.70) and the Allied Field Trip (4.22).

In these results, it is apparent that some workshops or activities were not intended to be evaluated due to cancellation, although a small number of youth participants provided ratings. Activities or workshops with fewer than 15 ratings were not included in the above summary.

Results from the evaluation of how much youth participants enjoyed and learned from various workshops and activities at Camp Success are presented below in Table 13.

Table 13 Evaluation Results: Enjoyment of and Learning from Workshops and Activities

Program Site	Workshop or Activity	Average Enjoyment	Average Learning
Columbia, SC Sample = 14	Computer Orientation	3.79	4.41
Orangeburg, SC Sample = 0	Computer Orientation	--	--
Columbia, SC Sample = 28	Ice Cream Sundae Building	4.43	3.86
Orangeburg, SC Sample = 19	Ice Cream Sundae Building	4.68	3.70
Columbia, SC Sample = 28	Un-Celebration Party Design	3.71	3.82
Orangeburg, SC Sample = 2	Un-Celebration Party Design	--	5.00
Columbia, SC Sample = 28	Wacky Shoes	4.46	4.32
Orangeburg, SC Sample = 20	Wacky Shoes	4.25	4.45
Columbia, SC Sample = 28	Leadership/Teambuilding Ropes Course	4.43	4.21
Orangeburg, SC Sample = 20	Leadership/Teambuilding Ropes Course	4.40	4.37
Columbia, SC Sample = 28	Widget Factory Simulation	3.50	4.18
Orangeburg, SC Sample = 20	Widget Factory Simulation	4.15	4.63
Columbia, SC Sample = 27	Bose Field Trip	4.07	4.26
Orangeburg, SC Sample = 18	Allied Field Trip	4.11	4.22
Columbia, SC Sample = 6	Prototyping	3.83	3.83
Orangeburg, SC Sample = 1	Prototyping	--	4.00

SUMMARY: *The Leadership/Teambuilding Ropes Course was regarded at both program sites as being highly enjoyable. The ice Cream Sundae Building activity was consistently rated as highly enjoyable, and with equal consistency rated as being of little educational value. The Widget Factory Simulation was generally regarded as being among the least enjoyable; of the workshops or activities, although participants appeared to value it as a learning experience.*

Reactions to the Design Project Experience

Youth participants were asked to indicate their level of agreement with four statements referencing the Design Project experience. The level of agreement responses in the Likert-type scale were coded with the following values:

- Strongly Disagree = 1
- Disagree = 2
- Neutral / Don't Know = 3
- Agree = 4
- Strongly Agree = 5

The youth participants at both program sites reported highly positive reactions to the Design Project experience. Generally speaking, the youth at both sites indicated that the Design Project experience was enjoyable and educational and that they believed that their efforts were worthwhile and valued by the customers. Results from the evaluation youth participants reactions to the Design Project experience are presented below in Table 14.

Table 14 Evaluation Results; Reactions to the Design Project Experience

Program Site	Design Project Statement	Average Response
Columbia, SC Sample = 28	I learned a lot from the Design Project.	4.21
Orangeburg, SC Sample = 20	I learned a lot from the Design Project.	4.55
Columbia, SC Sample = 28	I enjoyed working on the Design Project.	4.25
Orangeburg, SC Sample = 20	I enjoyed working on the Design Project.	4.60
Columbia, SC Sample = 28	I contributed a lot to our team's project.	4.46
Orangeburg, SC Sample = 20	I contributed a lot to our team's project.	4.45
Columbia, SC Sample = 28	We produced high quality results for our customer.	4.54
Orangeburg, SC Sample = 20	We produced high quality results for our customer.	4.60
Columbia, SC Sample = 28	The customer seemed happy with our work.	4.22
Orangeburg, SC Sample = 20	The customer seemed happy with our work.	4.70

SUMMARY: *The Design Project experience appears to be both enjoyable and educational for youth participants, and is perceived by the youth as a valuable service to “real world” clients.*

Youth Participant Measures of Overall Satisfaction

Youth participants were asked to indicate their level of agreement with four statements referencing their overall experience at Camp Success. The level of agreement responses in the Likert-type scale were coded with the following values:

- Strongly Disagree = 1
- Disagree = 2
- Neutral / Don't Know = 3
- Agree = 4
- Strongly Agree = 5

The youth participants at both program sites reported high overall satisfaction with the Camp Success experience. Results from the evaluation of youth participant overall satisfaction are presented below in Table 15.

Table 15 Evaluation Results: Measures of Overall Satisfaction

Program Site	Overall Satisfaction Statement	Average Response
Columbia, SC Sample = 28	The program staff were helpful and friendly.	4.64
Orangeburg, SC Sample = 20	The program staff were helpful and friendly	4.70
Columbia, SC Sample = 28	The program was well organized	4.54
Orangeburg, SC Sample = 20	The program was well organized	4.90
Columbia, SC Sample = 28	The food was good	4.25
Orangeburg, SC Sample = 20	The food was good	4.68
Columbia, SC Sample = 28	The working arrangements were good.	4.43
Orangeburg, SC Sample = 20	The working arrangements were good.	4.68

SUMMARY: Youth participants at both sites reported high levels of overall satisfaction with the Camp Success experience.

Conclusions and Recommendations

Formative and summative evaluation results clearly suggest that the Camp Success program, as implemented at the Columbia and Orangeburg sites in 2006, was very effective. Youth participants universally rated the program highly as both enjoyable and educationally valuable.

Camp Success shows positive and statistically significant impacts on youth participant understanding of engineering, and has a meaningful impact on youth confidence that careers in engineering are achievable. Several skills and abilities are effectively exercised during the camp experience, and youth confidence and self efficacy appear to be positively impacted.

At the Orangeburg program site parent/guardian beliefs that they understand engineering and engineering careers significantly improved. At the Columbia program site, parents/guardians reported slightly improved understanding of engineering and engineering careers, although the difference was not statistically significant.

Youth participants indicated the Leadership/Team Building Ropes course was the most enjoyable activity of camp. They also rated the Ice Cream Sundae Building icebreaker as highly enjoyable but with little educational value. The Widget Factory Simulation was generally regarded as being among the least enjoyable of the workshops or activities, although participants appeared to value it as a learning experience. The Design Project experience appears to be both enjoyable and education for youth participants, and was perceived by youth as a valuable service to “real world” clients.

Small sample sizes at the two program implementation sites mean a great deal of variance must occur between pre- and post-program ratings for results to have statistical significance. Improvements will be made to future data collection instruments to increase the potential to capture meaningful program outcomes. The sponsors of Camp Success are committed to an on-going continuous quality improvement process. Program evaluation results will be used to shape future program decisions and to measure and document long term effects of participation in Camp Success on students, teachers, and the field of engineering.