Launch-IT
An NSF Information Technology Experiences for Students and Teachers (ITEST) Project
Evaluation Report
June 2008

Overview

The Launch-IT Program has now completed its second successful year of sessions, thanks to funding received from the National Science Foundation Information Technology Experiences for Students and Teachers (ITEST) Program in October 2006. The goal of the program is to "promote academic achievement in information technology for at-risk middle and high school students in the Greater Lehigh Valley". The program provides summer and year-round technology curricula for students from grades 6 through 12.

Teams

During the academic year, the Launch-IT Program conducted a program from October of 2007 through May of 2008. The classes were held on one Saturday each month from 8:15 to 4:15. The program enrolled 79 students in total, 60 students completed the entire program with an overall retention rate of 75.9%. The Robotics Team began with 24 students; however only 20 of the students completed the entire program. The Flash Team had 35 students, and nine dropped from the program, leaving 26 students at the end. Finally, the Java Team began with 16 students and finished with 14 students. A table of the students by gender and ethnicity appears below. The 66 students listed as the total for the school year are those students who did not officially withdraw from the program. However, six of these students did not attend any of the sessions in the spring, and they were included in the withdrawals when the retention rate was computed.

	Total	Males	Females	Hispanic/Latino	African American/ Black	Caucasian	Asian/ Native American	Other
Summer								
Robotics	9	4	5	5	1	3	0	0
Flash	25	9	16	15	4	6	0	0
Java	21	10	11	9	5	3	4	0
Frequency	55	23	32	29	10	12	4	0
Percentage		41.8%	58.2%	52.7%	18.2%	21.8%	7.3%	0.0%
School Year 07-08								
Robotics	24	14	10	10	10	4	0	0
Flash	27	17	10	13	6	8	0	0
Java	15	7	8	7	5	2	1	0
Frequency	66	38	28	30	21	14	1	0
Percentage		57.6%	42.4%	45.5%	31.8%	21.2%	1.5%	0.0%
		Allentown School District		57%	17%	24%	2%	<1%
		Bethlehem School District		31%	16%	58%	3%	<1%
		PA State Average		6%	9%	75%	2%	<1%

The stated goal of the Launch-IT program is to "promote academic achievement in Information Technology for at-risk middle and high school students in the Greater Lehigh Valley." The enrollment records show that recruitment of ethnically diverse and gender-equal classes was highly successful. For the summer sessions, females slightly outnumbered males. For the Spring session, males slightly outnumbered females in total enrollment. Only the Java group had a greater number of females in the

group. Regarding ethnicity, the program did an excellent job at marketing and recruiting representative populations from the area. Both Allentown and Bethlehem School districts have a very high ethnic populations compared to the state average. Enrollments of non- white students in the Launch-IT program very closely mirrored total populations of students in the Lehigh Valley.

Personnel

The Co-PIs are Dr. Glenn Blank and Dr. Henry Odi. *The Robotics* sessions for 6th and 7th graders were taught by Ms. Jennifer Walz, a middle-school technology teacher. The Team Leader was Dr. Duke Perreira; however, Dr. Perreira was on an extended sabbatical this year, and the team turned to Dr. Glenn Blank, the PI, when assistance was needed. Also involved with these sessions were: Isaac Rieksts: Graduate IT Assistant, Eric Rosenberg: IT Assistant, Safiya Nieves: IT Assistant and Foster Newcome: Tutor. *The Flash Team*, for 8th and 9th graders, was led by middle-school technology teacher, Jane Carr, along with faculty advisor, Dr. Lynn Columba. Mike Sands, was the Graduate IT Assistant, Sonya James, IT Assistant and Nicole Jelic, Tutor. Finally, Chad Neff led *The Java Team* of 10th, 11th, and 12th graders, along with the help of Dr. Glenn Blank, who served as faculty advisor for this team. He was assisted by Graduate IT Assistants: Nick Moukhine and Tamara Peffer and IT Assistants: Stanislav Tsaney, Matthew Prestifilippo. The program was also served by Chen Li, IT Volunteer, and Kaley Schlechter, who tutored the students.

Activities

The typical day started for the students with a group activity to engage the students led by the Launch-IT Program Director, Teniece Johnson. Breakfast food was available. After this, students went to their assigned classroom or computer lab to meet with their team. The teams planned a variety of activities, including computer-related activities, the 24 Math game, and when weather permitted, outdoor projects. In addition to scheduled activities, all teams had scheduled tutoring time for one hour each session.

The Robotics Team completed hands-on-activities such as launching rockets, and gliders, website design, html, bridge construction, robotics and simulation. Students also engaged in an egg drop, a simulated mission to mars, learned how to make a flashlight and gained experience with soldering. As a final project, each team was to create a website based on one or more of their activities from the Launch-IT sessions over the year.

The Flash Team had a large number of students return from the summer program who were ready to progress to more advanced material. The main project in which the students were involved is called "Podcast", something like public service announcement. Students picked a topic which they felt strongly about and created a message about the topic. Students also worked with Flash and ActionScript programs to create a jukebox on the computer. Students selected a song of their choice to import and created custom animation to accompany the song. Upon completion, students presented their work to the class and engaged in a peer review process. Flash team members also engaged in movie making with Flash which included creating a storyboard, stick figure animation, and voice recording. Finally, students in this team also worked with GPS and Navigon systems as well as with UPC and ISBN Codes which they learned to interpret.

The Java Team also had a number of students returning from the summer program who were eager to move ahead. Students were divided into a novice and intermediate group, so that the returning students could continue to learn while the newer students learned the basics. They learned about Java programming and learned about Flash. Students in this class chose from one of two possible final projects: Ticket Machine Programming or Game Programming

Field activities: In addition to the individual team activities, there were two presentations for all Launch-IT students. On 12/08/07, Linda Bell did a presentation on Admissions and Financial Aid, and in addition to the students, three parents attended this session. On 1/26/08, Jill Cortiglia spoke about her career as a web designer and did an exercise to create a logo for Launch-IT. The only outside activity during the school year occurred on March 15th, when the students attended the Lehigh University Science Fair. Also, on other occasions, they visited Packard Lab, which houses the Computer Science and Engineering Department.

Closing Activities: The program ended Saturday, May 10th at 4:00 pm with a "Closing Explosion". Parents of students enrolled in the program were invited to attend and were given an opportunity to evaluate the program with regard to what they saw and feedback that they heard from the students. All assembled in a lecture hall where students from each team demonstrated what they had learned to parents and school administrators. Finger foods were available.

Although there was not an official count, the evaluator estimated that approximately 100 were in attendance at the Closing Explosion, including the students, the Launch-IT teams, parents and relatives, and several school administrators. Dr. Karen Angello, Superintendent of the Allentown School District, attended along with two other administrators from that district.

Evaluation

Methods:
The evaluation for the Launch-IT program employed four methods of assessing the program.

Feedback Forms
At the end of each session, the students completed an on-line feedback form which was available through SurveyMonkey. The students rated various aspects of the program: working on the computer, learning about the computer, doing schoolwork with a Lehigh student; outside speakers; outside activities, food, and bus service. They indicated whether they were: 1= not at all, 2= a little, 3=pretty or 4=very satisfied. If they were "not at all" or only "a little" satisfied, they were asked to explain. They were also asked to list what they liked best and least during the session and to describe briefly what they learned. The survey also contained a space for them to suggest what might make the program better.

In addition to the student feedback, the IT Staff were asked to respond to a similar survey after each session. The staff was asked to estimate students' interest in hands-on computer activities, lectures about the computer, mentoring/tutoring with IT Assistants or Lehigh Students, outside speaker(s), outside activity(ies) (field trip, etc.), communication skills training, and other activities. In addition, they recorded external speakers, outside activities, and they were asked what worked best and what they would like to improve. At the end of the sessions, the staff also responded to email questions about their overall perceptions regarding the academic year.

Pretest/Posttest
As a second method of assessment, a pre and posttest was given to all students in the Launch IT program as well as to students participating in Lehigh University's S.T.A.R. (Students That Are Ready) Academy. The students in the S.T.A.R. program represent a similar population of students from academically disadvantaged and/or at-risk middle/high school aged children from the Lehigh Valley area. Although the S.T.A.R. program is similarly geared toward strengthening academics, it does not have the same focus on technology as the Launch IT program. Based on the similarities in age, income, education, and ethnicity these students make an excellent control group for measuring changes in attitudes toward Informational Technology between the two groups. The test was given in both pretest and posttest format in hopes that

students would make gains in positive attitudes toward use and careers with computers. Along with sections on the students' background and career plans, the tests included parts of the Computer Attitude Survey developed for ITEST by Gerald Knezek, Rhonda Christensen, Keiko Miyashita, and Margaret Ropp. © 2000 Institute for the Integration of Technology into Teaching and Learning. University of North Texas, Denton, Texas, USA. ISBN # 1-931410-00-3. This was used with permission from the authors. For logistical reasons, a pen-and-paper version of the pretest was given to the S.T.A.R. students, and the instrument was available online through SurveyMonkey for students participating in the Launch-IT Program. A copy of the Attitude Survey for S.T.A.R. Students appears in Appendix 1.

Seventy-five S.T.A.R. students completed the pretest on Saturday, February 10, 2007 and 71 completed the posttest on April 19, 2008. Fifty Launch-IT students completed the pretests on the first Saturday session on March 31, 2007 and 42 completed the posttest on April 19th, 2008, the second-to-last session of the academic year. The original evaluation plan was to match each student's pretest and posttest scores to see whether there were differential gains between the two groups. In order to do this, consents were required from the S.T.A.R. parents since the students were required to include their names along with their responses. Unfortunately, only 24 of the 75 parents returned their consent forms. This did not present a problem for the Launch-IT students, since these evaluation activities were specified in the original consent form signed by parents when they enrolled their children. A further complication arose as students enrolled for the Launch-IT summer session and the 2007-08 academic year sessions. Only 19 students who responded to the posttest began the program in spring of 2007. It became apparent that the turnover of Launch-IT students would make it difficult to match enough students to do a valid analysis using matched pretest-posttest scores.

Although the student populations changed somewhat from the pretest to the posttest, comparisons of the posttest scores between the Launch-IT and S.T.A.R. students would still provide a snapshot view of the differences between students who had been focusing on computer activities over the school year versus students who were focusing on academics in general. In discussions with Dr. Henry Odi, Director of the S.T.A.R. program and co-PI of Launch-IT, and with a member of Lehigh's Institutional Review Board, it was decided that consents would not be required from the S.T.A.R. parents for the posttest provided that the students did not provide identifying information with their responses.

To improve this component of the evaluation for next year, the tests will be administered at the beginning and end of a single session, most likely administering the pretest at the start of the fall and the posttest in the spring. Because of the problems collecting parental consent from the S.T.A.R students, the tests will still be anonymous; however, using a single session will assure that the students taking the posttest will be from the same group that took the pretest.

The data were analyzed using SPSS (Statistical Package for the Social Sciences). Scales measuring Computer Importance, Computer Enjoyment, Study Habits, Persistence/Motivation, and Lack of Computer Anxiety were created following directions in "Instruments for Assessing Educator Progress in Technology Integration", which was provided by the creators of the instrument. Scales were also computed that measure preference for, difficulty of, and learning from four activities, including reading, writing, television, or computer. The students completed three sets of questions that paired each activity with the other three (six pairs in all). For example, in the first set of questions, students were asked to select whether they preferred reading to writing, television, and computers. If they selected reading over the other three activities, they received a score of 3; if they preferred the other activities over reading every time; they received a score of 0. They then completed a set of questions for the activity that they found more difficult and the activity through which they learned the most.

Rubric

In order to judge whether the Launch-IT sessions imparted technical skills to the students, each team was asked to assign a technology project related to the subject matter covered during the academic year. This project would be scored using a generic rubric, which was suggested by Dr. Lynn Columba, Associate Professor of Education and Human Services, and was revised by the evaluator. The rubric included four categories that each team was required to use. They were: Format, Mechanics, Content, and Creativity. The teams were encouraged to provide their own descriptions of their expectations for each of these categories based on the specific project and the age of the students. They were also allowed to add one or two additional categories that pertained to their project. Each category was to be rated on a scale from 1 to 4 with 1=Minimal; 2=Satisfactory; 3=Good; and 4=Excellent. The generic version of the rubric can be found in Appendix 2.

Unfortunately, not all the teams followed the instructions. The Robotics Team used only 3 of the 4 categories, giving them a possible range of scores from 3 to 12. The Java Team followed the directions and added an additional category for Documentation. The possible range of scores for this group was 5 to 20. The Flash Team created their own rubric, which did not use any of the categories in the generic rubric. The rubric used by this team can be found in Appendix 3. Because of these variations, the means of the categories and the overall means cannot be compared directly. In order to provide some comparison, percentages were computed by using the average total score divided by the total possible points.

This issue will be discussed at the next Launch-IT meeting. For the summer session and the 2008-09 academic year sessions, all teams will be urged to use the generic rubric categories for which they provide descriptions of their expectations for each category based on the specific project and the age of the students.

Assigned Projects. The Graduate IT Assistant gave a PowerPoint presentation to the students in the Robotics Group that outlined what they were to include in the final project. The students were to select one or more activities from their Launch-IT sessions and design a website about those activities. The website needed to include a table as well as pictures, and the students were rated on their creativity.

The students in the Flash Group were told to create a public service announcement using Flash. The announcement was to be on a topic of interest to the student and should last no longer than three minutes. Students were rated on their ability to use Flash effectively to communicate their message. They were told to use skills they mastered over the school year, such as tweening, use of symbols or movie clips, and programming using actionscript.

The Java Group students could choose one of two projects involving Java - Ticket Machine Programming or Game Programming. To do this successfully, the students had to create a plan, identify the necessary attributes, identify necessary methods, design Java programming, create a Flash Interface prototype, insert the program into applet, and modify and personalize it. They were allowed to use Dreamweaver, Flash, PowerPoint, Moviemaker, or other productivity software. The students were reminded that their final projects should be of a quality to use in their portfolios and could be viewed by parents, administrators, and other IT professionals.

Feedback from Parents on Closing Explosion

A final method of evaluation was included at the Closing Explosion event. The parents of the children involved with the program were given a feedback form and asked to evaluate the program in four ways. Parents were asked to rate their responses on a scale of 1- 3. The questions were: 1) Do you feel the Closing Explosion program was effective in showing you what the students learned; 2) To what extent do

believe skills taught to the students in Launch-IT program will help students in school and their careers; 3) Would recommend the program to other parents/schools or districts, and 4) If Launch-IT students spoke to you about the program, what kind of things did they say?

Results

Launch-IT Student Feedback. All of the students were between "pretty" and "very" satisfied with all of the categories and across all of the dates throughout the year. Overall, "Working on the computers" retained the highest average scores followed by "Food" and "Outside Activity." Below are the overall means for the entire group and by team.

How satisfied were you with the following?
Code: 1= not at all, 2= a little, 3=pretty or 4=very satisfied

	All	Robotics	Flash	Java
Working on the computer	3.6	3.6	3.7	3.5
Learning about computer	3.4	3.3	3.5	3.5
Doing Schoolwork w/ tutor	3.4	3.3	3.5	3.3
Outside speaker	3.3	3.2	3.4	3.3
Outside activity	3.5	3.7	3.4	3.4
Food	3.6	3.6	3.7	3.3
Bus Service	3.2	3.3	3.3	3.0

Average scores remained relatively constant over time with only minor fluctuations in both directions each month. For all teams combined, the last feedback scores collected in May, the final month of the program, were slightly higher or equal to the scores first reported in October when the program began. (see Appendix 4). It should be noted here that the number of respondents dropped rather steadily from October (n=60) to April (n=30). In May, there were even fewer respondents, but this was an aberration likely due to last minute work on presentations for the Closing Explosion, which occurred later that day. It was also Mother's Day weekend, and other students were involved in various sports events. The numbers of responses as the year progressed fall somewhat short of the numbers of students reported in those classes even when adjusted for the retention rate. The most likely explanation is that the students did not follow their team staff's directions to complete the survey and instead continued to work on other activities on the computer.

Average scores also increased or remained exactly the same from the first month to the last for each group with the exception of one category for each group (see Appendix 4). For the Robotics team "Doing schoolwork with tutor" began with a mean rating of 3.3 and ended with a mean rating of 3.2. For Flash team, the mean score reported in October in the category "Satisfaction with outside speaker" was 3.1 but dropped to 3.0 for an end score in May. The Java team saw a drop in score for the category "Satisfaction with Bus Service" beginning with 3.2 and ending with 2.0 in April. Although this drop seems drastic, it should be noted that for the same month Bus Service received a mean rating of 3.0 from the Flash team and 3.6 for the Java Team. Comments regarding Bus Service in the qualitative feedback were sparse but seemed to indicate that a single bus for all students in the program was "overcrowded" and therefore the route "took too long."

When asked to give an explanation of why they were "not at all or only a little satisfied", most students used this "please explain" space to reiterate that they were satisfied with everything. The majority of the comments regarding dissatisfaction tended to concern lunch or bus services. Some students did not like

the choice of dining options available. The primary restaurants utilized by this program were a local deli serving sandwiches and a Lehigh luncheonette. The dissatisfaction may be a reflection of cultural taste in food choices as one student noted: "Because I don't want [this] food and will not eat it."

This section of the feedback form had the most comments in the first month of the program. For example, in October there were six responses regarding food and one about the bus. Regarding the program components, four students indicated dissatisfaction with the homework segment, and two students did not know about or like computers. One student already knew about computers; one commented that the program wasn't fun, and another commented that it was fun. Sequential months had only between 5-8 comments total for this section. In the final category of the feedback form: "Use this space to tell us anything about Launch-IT that you would like us to know/make it better" a few students requested more leisure time on the computer (specifically "MySpace"), but many students requested "More Learning." This enthusiasm for the program and thirst for continued learning was evidenced through comments like:

"This is the BEST place I've ever been to;" "How do they make robots?" "My favorite part of today was when we went outside and we did the experiments with the rockets. That was really cool. I also liked when we built the rockets that was challenging yet very fun." (Robotics students)

"I liked being able to get back on the computer and being able to use Flash;" "The best part was the tutoring time! I had lots of fun!!" "I learned there are many different fun and exciting things you can do with the computer." (Flash students)

"I learned so much and enjoyed myself." "[I liked] the new Java stuff, because I actually knew what I was doing, and I was very excited about doing it." "I liked learning how to actually use Java and move objects on my computer screen;" " I liked best when we separated the new people and the people that already were here;" "At first there were some things that I thought I wasn't going to understand, but it all came clear to me;" "Only the little kids enjoy those games [at the beginning of the sessions]. I'd rather just go straight to my team." (Java students).

When asked what students liked most about their sessions, Robotics Team frequently mentioned activities such as Launching rockets, the egg drop, flying glider planes, working with robots, making websites and going outside. Flash students mentioned activities such as working with Flash, making a pumpkin on the computer, learning origami, and making a podcast. Java students reported that they most enjoyed using Java and practicing what they had previously learned, designing ATMs, and gaining hands on experience with computer programming. When asked what they liked least, all groups frequently restated that they enjoyed everything; however, a few listed the math game, the tutoring, and the homework as their least favorite parts of the day.

Although students in all three groups seemed to genuinely enjoy the program, significant differences were found between groups in several categories. In the category "Satisfied with work on computer" between the Flash and Java groups, Flash was found to be more satisfied. Flash group was also found to be more satisfied than Robotics group in the indices that measures satisfaction with learning about the computer; Satisfied with tutoring, Satisfied with outside activity. Finally, in the category Satisfied with food, Robotics and Flash were significantly more satisfied than Java.

Pretest/Posttest

Reliabilities for the scales measuring Computer Importance, Computer Enjoyment, Study Habits, Motivation/Persistence, and Lack of Computer Anxiety ranged from .711 to .834. Appendix 5 contains

the reliabilities for these scales from the Computer Attitude Survey and the specific items that comprise each scale.

T statistics were computed to see whether there were significant differences between the Launch-IT students and the S.T.A.R. students for both pretest and posttest. The means, t statistics, degrees of freedom, and two-tailed significance levels appear below.

Launch-IT vs. S.T.A.R. Pretest

Code: 1=Strongly Disagree; 2=Disagree; 3=Undecided; 4=Agree; 5=Strongly Agree

	Means				Sig.
	Launch-IT	S.T.A.R.	t	df	(2-tail)
Computer Importance (avg. 6 items)	4.29	4.14	1.29	75	.200
Computer Enjoyment (avg. 9 items)	4.42	4.33	0.82	72	.414
Study Habits (avg. 10 items)	3.88	3.61	1.93	75	.057
Motivation Persistence (avg. 8 items)	3.77	3.43	2.35	75	.022*
Lack of Computer Anxiety (avg. 8 items)	4.46	4.25	1.32	38.8	.195†

Launch-IT vs. S.T.A.R. Posttest

Code: 1= Strongly Disagree; 2=Disagree; 3=Undecided; 4=Agree; 5=Strongly Agree

	Means				Sig.
	Launch-IT	S.T.A.R.	t	df	(2-tail)
Computer Importance (avg. 6 items)	4.12	4.00	2.22	104	.029*
Computer Enjoyment (avg. 9 items)	4.30	4.23	-1.40	102	.164
Study Habits (avg. 10 items)	3.67	3.64	1.21	103	.229
Motivation Persistence (avg. 8 items)	3.50	3.49	1.83	103	.070
Lack of Computer Anxiety (avg. 8 items)	3.92	4.32	-2.76	101	.007**

*p < .05
** p < .01
† t statistic was computed using formula that does not assume equal variances.

Note: The means below represent the average number of times that respondents chose the item (e.g., reading) over the other three items (e.g., writing, television or computers). The range is from 0-3.

	Means				Sig.
	Launch-IT	S.T.A.R.	t	df	(2-tail)
Prefers to Read	0.90	0.94	-2.31	111	.818
Prefers to Write	0.57	0.75	-1.17	111	.245
Prefers TV	1.52	1.65	-0.78	111	.439
Prefers the Computer	2.60	2.54	0.41	111	.680
Finds Reading Difficult	1.52	1.76	-1.17	111	.243
Finds Writing Difficult	1.86	2.13	-1.41	111	.161
Finds TV Difficult	0.70	0.58	0.71	111	.479
Finds Computer Difficult	1.17	1.38	-1.00	111	.317

	Means				Sig.
	Launch-IT	S.T.A.R.	t	df	(2-tail)
Learns more from Reading	1.74	1.89	-0.80	111	.424
Learns more from Writing	0.57	0.68	-0.71	111	.480
Learns more from TV	0.76	0.93	-0.96	111	.342
Learns more from Computers	2.33	2.37	-0.20	111	.839

One significant difference occurred at the time of the pretest on the Motivation/Persistence Scale, with the Launch-IT students scoring higher on this item than the S.T.A.R. students. No other differences occurred between the two groups on the computer attitude indices or on the section that compares their preferences for, difficulty of, or learning from reading, writing, television, or computers. Both Launch-IT and S.T.A.R. students preferred computers, found writing most difficult, and learned most from computers.

T-tests comparing Launch-IT posttest scores to S.T.A.R. posttest scores show significant differences between Launch-IT students and S.T.A.R. students in two categories. Launch-IT student ranked "Computer Importance" significantly higher than did the S.T.A.R. students. This is an expected result in the predicted direction. One would expect students who enroll in an IT program to understand the importance of computers. The other significant difference was in "Lack of Computer Anxiety", in which the S.T.A.R students scored significantly higher. This difference was not in the expected direction, since it was believed that practice on the computer would reduce computer anxiety for the Launch-IT students. After some reflection on this unexpected finding, however, it began to make sense. The S.T.A.R. students were not working extensively with computers, while the Launch-IT students were learning new software and applications. The S.T.A.R. students' experience with computers was likely to remain the same from the pretest to the posttest, since their computer activities may have been more recreational in nature, such as computer games, MySpace, or Facebook. Not only did the Launch-IT students learn new programs, but at the time of the posttest, they were in the midst of creating their final projects for the academic year. This may have been responsible for their heightened anxiety at the time of the posttest, and indeed, comparisons of the Launch-IT students' pretest and posttest scores on this item were significantly different, showing increased computer anxiety at the time of the posttest. On the other three items, computer enjoyment, study habits, and motivation persistence, the posttest scores for the Launch-IT and S.T.A.R. students were very similar and were not significantly different.

Overall, the Launch-IT students had slightly higher scale scores on Computer Importance, Computer Enjoyment, Study Habits, and Lack of Computer Anxiety, but they were not significantly different. Regarding the scales in which students indicate their preferences for reading, writing, television, or computer, both the Launch-IT students and S.T.A.R. students prefer the computer to the other activities, followed by television. Both groups also find writing the most difficult activity, and both agree that they learn more from computers than from the other activities. None of these differences were significant in the posttest.

To explore the Launch-IT students a bit more, a one-way analysis of variance was conducted on the posttest for the Launch IT students to do determine if there was any variation among the groups. The means are below with the F statistic, degrees of freedom, and significance.

	Means					
	Robotics	Flash	Java.	F	df	Sig. (2-tail)
Computer Importance	4.25	4.25	4.21	0.022	2,38	.978
Computer Enjoyment	3.82	4.26	4.31	3.742	2,35	.034*
Study Habits	3.76	4.02	3.53	1.421	2,37	.254
Motivation Persistence	3.70	3.94	3.50	1.025	2,36	.369
Lack of Computer Anxiety	3.45	4.09	4.47	3.503	2,34	.041*

Significant differences were found between groups in several categories. For the index measuring "Computer Enjoyment" significant differences were found between the Robotics and the Flash team as well as between the Robotics and Java team. These differences indicated that both the Java and Flash teams enjoyed the computer more than did the Robotics team. No significant differences were found between the Flash and Java groups. Significant differences in the index which measures a lack of computer anxiety between Robotics and Java groups demonstrate that the older Java students are more at ease with the computer. In fact, form observing the means, it appears that the students' comfort levels increased as they gained more experience with the computer. The post hoc analysis results can be found in Appendix 6.

Two significant differences between groups were also found in the scales in which students indicate their preferences for reading, writing, television, or computer. Java students report that they "learn from reading" at significantly higher rates than Robotics students do. Finally, Flash students prefer the computer over all other methods of learning (e.g.; television, reading and writing) significantly more than Robotics students do.

Computer-Related Courses. At the pretest and posttest, students were asked how many high school courses related to computers that they would take before they graduate. There were no differences between the pretest and posttest in the estimated number of classes by the Robotics, Flash or Java students. Those in the Robotics classes estimated that they would take 3 to 4 courses; the Flash students expected to take 4 courses, and the Java students estimated that they would take 3 courses.

Careers. In the pretest, 7 of the 26, or 26.9% of the Robotics respondents mentioned computer-related careers; however, this was often mentioned among four or five other unrelated careers. When asked in the posttest the careers in which they are interested, 4 out of 19, or 21%, of the students in the Robotics Group cited IT-related careers, including computer technician or engineer, IT specialist, or video game tester or designer. Another 42% mentioned careers that require college training. In the Flash group pretest, 38.5% of the students, or 5 out of 13, mentioned IT-related careers, most often designing video games. Once again, these careers tended to be mentioned among a number of other non-computer related careers. In the posttest, 3 of the 12 Flash students, or 25%, stated that they would like to be involved in IT careers. All of them mentioned designing and/or testing video games. Another 50% of these students mentioned careers in engineering, medicine or other professional careers. Finally, on the pretest, 3 of the 12 Java student's responses involved computer programming. On the posttest, 5 of the 8 students who responded, or 63%, would like to pursue a career in computers. The remaining three students mentioned careers such as engineering, teaching, or medicine. The Java students showed an increase in the percentage of students seeking degrees in information technology, and these are the students who will be applying to colleges soon and deciding on their majors. It is hoped that the Robotics and Flash Sessions will encourage those students who are currently interested in computers to continue in the Launch-IT Program and, perhaps, decide that careers in computer science offer an interesting and challenging career.

Rubric

The final projects were graded by the Graduate IT Assistants and/or the Launch-IT teacher(s). The rubric scores by team are presented in the table below. The Robotics students' scores ranged from 5 to 12. The students scored highest on the Content Category, in which they demonstrated knowledge of the computer programs, their terminology and uses. The average overall score was 9.2 out of a 12 possible points.

The scores of the students in the Java Group ranged from 5 to 20, with an average score of 15.3 out of 20 possible points. Only one student had a score of 5, and the remainder of the scores ranged from 10 to 20. When the lowest outlier is removed, the mean jumps to 16.2. Once again, these students seemed to perform best on the Content Category. The area in which they needed to see improvement was in the Documentation Category, where the average score was 2.4, a rating between Satisfactory and Good.

Finally, the Flash students' scores ranged from 10 to 15, with a mean of 12.9 out of 16 possible points. They did well in the Design and Presentation Categories. An average score of 3.8 suggests that the students' performance was exemplary in these areas. Their weakest area was in Programming, in which the students were partially proficient.

For each of the groups, the average overall score represented about 75% of the total possible score. These scores demonstrate that a sufficient amount of learning has taken place. Using the Generic Rubric format, this would be described as a "good" performance, and using the Flash Rubric, this would be described as "proficient".

		Format	Mechanics	Content	Creativity	Documen-tation	Total	Percent of Possible Points
Robotics Team	Mean	2.9		3.3	3.0		9.2	76.4%
	Count	12		12	12		12	
	Std. Dev.	0.90		1.06	0.95		2.44	
Java Team	Mean	3.0	3.3	3.4	3.2	2.4	15.3	76.3%
	Count	12	12	12	12	12	12	
	Std. Dev.	1.04	0.97	1.00	1.03	1.16	4.33	
		Storyboard	**Design**	**Programming**	**Presentation**		**Total**	
Flash Team	Mean	3.0	3.8	2.3	3.8		12.9	75.0%
	Count	16	16	16	16		16	
	Std. Dev.	0.00	0.40	0.77	0.40		1.20	

Another important function of the final project and rubric scores is to pinpoint the specific areas where the curriculums can be revised to improve students' understanding and proficiency. The best way to accomplish this is to have the faculty team leaders, IT teachers, and graduate IT assistants meet to discuss the individual team results and brainstorm as to where the curriculums might be fine-tuned to help the students improve their rubric scores.

Monthly Feedback from Launch-IT Team Members

The staff also provided feedback at the end of each session. In addition to rating students' interest in the various activities, they provided information on the external speakers and outside activities. The results of their responses are in the table below and are listed with the students' means to provide a contrast.

How satisfied/interested were you/students with the following?

Student Code: 1= not at all, 2=a little, 3=pretty or 4=very satisfied

Staff Code: 1=not at all, 2=somewhat, 3=moderately, 4=very interested

	Robotics		Flash		Java	
	Students	Staff	Students	Staff	Students	Staff
Working on the computer	3.6	3.3	3.7	3.7	3.5	3.7
Learning about computer/lectures	3.3	2.5	3.5	2.9	3.5	3.1
Doing Schoolwork w/ tutor	3.3	2.9	3.5	3.1	3.3	3.0
Outside speaker	3.2	1.7	3.4	2.4	3.3	2.6
Outside activity	3.7	3.9	3.4	3.2	3.4	4.0
Food	3.6	na	3.7	na	3.3	na
Bus Service	3.3	na	3.3	na	3.0	na
Communication skills training	na	2.6	na	3.2	na	3.2

The means above show that the staff tended to underestimate students' interest in outside speakers. Students were between pretty and very satisfied, but the robotics staff indicated that students were only somewhat interested. The Flash and Java staffs reported that students seemed between somewhat and moderately interested. Generally, the staff estimated accurately the students' interest in working on the computer with very high scores. In other areas, learning about the computer/lectures and doing schoolwork with a tutor, the staff tended to underestimate slightly the students' interest. The Flash and Java team staffs estimated that the students were moderately interested in the activities geared to training the students in communication skills; the Robotics team felt that their students were only between somewhat and moderately satisfied with these activities.

Post-School-Year Feedback. After the 2007-08 academic year ended, the evaluator sent an email to the team members asking them for their reflections on the year. They were asked: How enthusiastic were the students? Do you have a sense that many of them are going to continue into the summer or next year? How was the experience for you during the school year? Is there anything you would like to change to make it better? The following summarizes the responses by team.

Robotics Team. The Launch-IT sessions went well. At times, the day seemed a bit too long for students who had spent all week in school and then had to spend a Saturday at a "learning" event. The students seemed to enjoy moving from one event to another, but tended not to take things too seriously because it was not school. Most of the students expressed an interest in taking the summer session. Those who were not returning for the summer tended to mention the fact that they could not make the three-week commitment because of their vacations. For the teacher, the time commitment was difficult, both in terms of preparation time and class time.

Flash Team. Most of the students in the Flash Team were enthusiastic (estimated at about 90%). The summer session felt easier and more fun than the academic year. This was because of the momentum and intensity of the three-week summer session. Still, it was felt that the school year meetings were important to focus the students on their academics and offer tutoring. This team had some problem with consistent attendance of the IT assistants and felt would be helpful to know when assistants would be attending. This team was not able to estimate how many students planned to attend the summer session, although they did notice interest from the students from Roberto Clemente Charter School.

Java Team. Four members of the Java Team provided feedback. The Graduate IT assistants felt that the students were enthusiastic, and that they came a long way with Java Programming. Observing students

working on the last day, one assistant saw all the students busily touching up their projects working on webpages, video editing, Flash, and Java. Students even did a video about why their friends should sign up for Launch-IT; the assistants both felt that the program achieved the goal of getting the students interested in IT. Students also made strides regarding their potential for higher education opportunities. One student was accepted into Rensselaer Polytechnic Institute for the fall, and one female student is interested in applying to Lehigh. The Java Team teacher reported that the students got rather far on the ATM project despite the problem of more frequent absences from the Saturday sessions. Based on their experience with the summer sessions, the groups were split by ability – novice and intermediate; some experienced students chose to stay in novice group but later moved to the intermediate group. This seemed to work well and kept tension levels down. One IT assistant mentioned that students seemed to be insulted by the "at risk" label. The teacher and faculty advisor did not notice any problems, but they both wondered where the students heard this phrase. Although it is used to determine the type of students the program would like to recruit, they did not think the term was ever used in the classroom. This will be brought to the attention of the Program Director, who will inform students that by enrolling in a program such as Launch-IT, they are ensuring that they will not be "at risk". The experience was positive for all of the Java Team staff. The assistants enjoyed their roles of teaching Java and providing supplemental activities, including critical thinking project and media awareness, and the teacher was completely in control of the Java activities for the novice group for the first time since starting Launch-IT.

Closing Explosion

Although only eight of the parents in attendance filled out a feedback form, those who took the time to do so reported being very pleased with the program. Seven out of eight of the parents found the closing explosion to be "very effective" in demonstrating what the students learned. Additionally, all parents who filled out a feedback form felt the program would help students with school and careers "a great deal" and all would recommend the program to other parents.

When asked to explain why they would recommend the program, the parents commented that it provides a good introduction to the world of technology. They felt that the program kept their children out of trouble and made learning fun. One parent commented that it is a great opportunity for children to explore their options. When the students spoke to their parents about the program, they talked about how much fun they had. In the comment/suggestions section, they thanked all the sponsors and everyone involved with teaching their children and encouraged them to "keep up the good work".

Analysis

The Launch-IT Program did an excellent job of recruiting females and students from underrepresented minorities. Almost half of the students are female, and 75% of the students are Hispanic/Latino or Black/African American.

Results of the feedback form clearly demonstrate that the students involved with Launch –IT are enthusiastic about the program. The teams' average ratings in all categories ranked between "pretty" and "very" satisfied, with computer activity ranking the highest. Written feedback indicated that students had few if any complaints. Some students felt the program was very challenging, while others indicated a desire for more class times and more time in class spent on learning about the computer. It seems likely that this discrepancy is due to the fact that some students were new to the program while others are returning students who have progressed from previous sessions. To compensate this gap in prior knowledge, some teams were further divided into two subgroups so that students could work within their own skill set.

This gap in skill set may further explain some of the significant findings discovered between the groups in the significant difference between the posttests for the Launch –IT and S.T.A.R. students. The Robotics students, who are the youngest students and likely have less experience with computers, enjoyed the computer significantly less than the more seasoned older students in the Java Team. Java, the oldest group, also reported significantly less anxiety toward the computer than the Robotics group. The Flash team, which was reported to have a large portion of students who had returned from prior programs, found significantly more satisfaction in 3 out of 7 feedback categories than Robotics team did and 2 out of 7 more than Java team . This further suggests age, prior experience, and skill levels upon program entry as possible contributors to anxiety and enjoyment levels.

A level of anxiety toward the computer was significantly higher than the mean score of the S.T.A.R. students on the posttest. This might be confounded by the fact that students in the Launch-IT program focused intensely on the computer and worked steadily toward a final computer project, while students in the S.T.A.R. might use the use the computer less for programming and more for less anxiety-provoking activities such as MySpace, which was mentioned repeatedly in the feedback by one student. In examining the differences among the groups, the youngest students in the Robotics group felt significantly more anxiety than the oldest students in the Java group, and the comfort levels seemed to improve for each of the levels. Launch-It students did rank significantly higher than S.T.A.R. students on the an index that rated the level of importance that the student accorded to computers. Other indices had nonsignificant differences, indicating that the Launch-IT program has demonstrated the value of a knowledge of computer skills.

As mentioned earlier in the report, an attempt was made to measure student's interest in working with computers in both the pre and posttest. The Robotics and Flash teams mentioned computer-related careers more often in the pretest; however, it was often listed with four or five other non-computer-related careers. At the time of the posttest, the students tended to list fewer careers per person, and the computer-related careers they mentioned were more focused. The Java group, consisting of high school sophomores, junior, and seniors, showed the greatest increase over time in pursuit of IT careers, and indeed, one of these students will be attending Rensselaer Polytechnic Institute in the fall. It will be interesting to continue to track returning students from Flash group, which had the largest portion of returning students and reported the most satisfaction in several categories.

The rubric demonstrated that a reasonable amount of learning occurred for all three groups. Robotics and Java students showed strength in areas pertaining to content – the category which really highlighted their learning through the program. Room for growth was noted in areas such as documentation, a skill students are likely to acquire through continued experience in working with data and managing projects. Flash team excelled with design and presentation, but scored lowest in programming. It is expected that those students who will return to the program, and especially for those moving from Flash into Java, will find that their programming skills increase as they continue to build on what they have already learned. These areas will be taken into consideration at future Launch-IT staff meetings to discuss how the curriculums might be changed to improve these scores.

Regarding the feedback given by staff, a comparison of staff ratings to student ratings showed that staff tended to underestimate student interest and enthusiasm in some areas. Staff were able to pinpoint areas of their program which they felt were strong, and were realistic when reflecting upon possible deterrents to students interest in an academic program occurring outside of the context of school.

Very few parents responded to feedback form at the time of the Closing Explosion; however, those who did had only positive things to say. In the future, a stronger effort should be made to tap the parents for their insight into their child's success with the Launch-IT program as they are in an ideal position to

observe changes and growth in their child's interest in computers as well as their child's interest in program attendance and return.

Overall, the Launch-IT Program has made progress toward achieving its stated goals. The students are enthusiastic about the program and demonstrated that they learned new computer skills over the course of the school year. They have an increased appreciation for the importance of computer training, and they are learning about career options in information technology. Parents are also very supportive of the program. The teams work well together to provide interesting and educational activities for the students, and the experience for them has been largely positive. Regularly scheduled meetings of the Launch-IT staff will be useful in reviewing and revising the curriculums and in emphasizing the importance of the evaluation activities required to demonstrate that the program has been successful.

Appendix 1: Attitude Survey for S.T.A.R. Students

Dear S.T.A.R. Student:

We want to know how you feel about computers and about your plans for the future. We are also going to ask these questions of students who will be in the Launch-IT Program, which studies technology. Your answers will be compared to those given by the Launch-IT students to see if they are different.

The survey is anonymous; do not write your name on the form.

The results will be sent in a report to the National Science Foundation and may be in papers or reports about the Launch-IT Program. If you have any questions about how your answers will be used, you or your parents can call Jean Russo at (610) 758-3803 or Ruth Tallman at (610) 758-3024.

If you fill out this form, you will be allowing us to use your answers as we explained above.

	6th	7th	8th	9th	10th	11th	12th
What grade are you in NOW? (check one)	☐	☐	☐	☐	☐	☐	☐

	Male	Female
What is your sex? (check one)	☐	☐

	6th	7th	8th	9th	10th	11th	12th
What grade were you in when you began the S.T.A.R. Program? (check one)	☐	☐	☐	☐	☐	☐	☐

Read each statement and then CIRCLE the answer that describes how you feel.
NOTE: 1 = Strongly Disagree; 2 = Disagree; 3 = Undecided; 4 = Agree; 5 = Strongly Agree

Part 1: Attitudes	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. I enjoy doing things on a computer.	1	2	3	4	5
2. I am tired of using a computer.	1	2	3	4	5
3. I will be able to get a good job if I learn how to use a computer.	1	2	3	4	5
4. I concentrate on a computer when I use one.	1	2	3	4	5
5. I enjoy computer games very much.	1	2	3	4	5
6. I would work harder if I could use computers more often.	1	2	3	4	5
7. I know that computers give me opportunities to learn many new things.	1	2	3	4	5
8. I can learn many things when I use a computer.	1	2	3	4	5
9. I enjoy lessons on the computer.	1	2	3	4	5
10. I believe that the more often teachers use computers, the more I will enjoy school.	1	2	3	4	5

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
11. I believe that it is very important for me to learn how to use a computer.	1	2	3	4	5
12. I feel comfortable working with a computer.	1	2	3	4	5

13. I get a sinking feeling when I think of trying to use a computer. 1 2 3 4 5
14. I think that it takes a long time to finish when I use a computer. 1 2 3 4 5
15. Working with a computer makes me nervous. 1 2 3 4 5
16. Using a computer is very frustrating. 1 2 3 4 5
17. I will do as little work with computers as possible. 1 2 3 4 5
18. Computers are difficult to use. 1 2 3 4 5
19. Computers do not scare me at all. 1 2 3 4 5
20. I can learn more from books than from a computer. 1 2 3 4 5
21. I study by myself without anyone forcing me to study. 1 2 3 4 5
22. If I do not understand something, I will not stop thinking about it. 1 2 3 4 5
23. When I don't understand a problem, I keep working until I find the answer. 1 2 3 4 5
24. I review my lessons every day. 1 2 3 4 5
25. I try to finish whatever I begin. 1 2 3 4 5
26. Sometimes, I change my way of studying. 1 2 3 4 5
27. I enjoy working on a difficult problem. 1 2 3 4 5
28. I think about many ways to solve a difficult problem. 1 2 3 4 5
29. I never forget to do my homework. 1 2 3 4 5
30. I like to work out problems that I can use in my life every day. 1 2 3 4 5
31. If I do not understand my teacher, I ask him/her questions. 1 2 3 4 5
32. I listen to my teacher carefully. 1 2 3 4 5
33. If I fail, I try to find out why. 1 2 3 4 5
34. I study hard. 1 2 3 4 5
35. When I do a job, I do it well. 1 2 3 4 5

Part 2: Preferences

36. Which would you rather do? **(Check ONE for each pair. There should be one check on each row.)**

☐	read a book	or	☐	write
☐	write	or	☐	watch television
☐	watch television	or	☐	use a computer
☐	use a computer	or	☐	read a book
☐	read a book	or	☐	watch television
☐	write	or	☐	use a computer

37. Which would be more difficult for you? **(Check ONE for each pair. There should be one check on each row.)**

☐	read a book	or	☐	write
☐	write	or	☐	watch television
☐	watch television	or	☐	use a computer
☐	use a computer	or	☐	read a book
☐	read a book	or	☐	watch television
☐	write	or	☐	use a computer

38. Which would you learn more from? **(Check ONE for each pair. There should be one check on each row.)**

☐	read a book	or	☐	write
☐	write	or	☐	watch television
☐	watch television	or	☐	use a computer
☐	use a computer	or	☐	read a book
☐	read a book	or	☐	watch television
☐	write	or	☐	use a computer

The previous questions were from the Computer Attitude Questionnaire in Instruments for Assessing Educator Progress in Technology Integration by Gerald Knezek, Rhonda Christensen, Keiko Miyashita, and Margaret Ropp. University of North Texas, Denton, Texas, USA. ISBN # 1-931410-00-3.

Part 3: Future Plans

39. How many HIGH SCHOOL courses in the following areas do you PLAN TO TAKE by the time you graduate?

Math courses	None	1	2	3	4	5 or more	Not sure		
Science courses	None	1	2	3	4	5 or more	Not sure		
Computer applications/programming courses	None	1	2	3	4	5 or more	Not sure		
Vocational/technical courses	None	1	2	3	4	5 or more	Not sure		

40. What do you plan to do AFTER you graduate from high school?

☐ Go to a four-year college or university
☐ Go to a community college
☐ Go to a vocational or technical school
☐ Get a full time job
☐ Enter the military
☐ Something else not listed above (please list)
_____
☐ I'm not sure what I want to do after high school

41. What are some careers that you are interested in?

	Yes	No	Don't Know
42. Have other people in your family gone to a college or university?	☐	☐	☐

Thank you for your help with this questionnaire.

Appendix 2: Generic Rubric for Final Project

Rubric to Rate Students' Final Projects

Name of Student Being Rated:					
Rater's Name:			**Date:**		
Rater's Position (check one): __ Launch-IT Student __ IT Teacher/Team Leader __ IT Assistant					
(Project)	**Minimal**	**Satisfactory**	**Good**	**Excellent**	**Student's Score**
Format - Followed all instructions, and all required content is present.	1	2	3	4	
Mechanics - Demonstrated proficiency with tools used -- used a variety of tools to achieve the purpose of project.	1	2	3	4	
Content - Demonstrated full knowledge of the computer programs, their terminology and uses.	1	2	3	4	
Creativity - Project layout is pleasing to the eye - student used variety of effects to make the output interesting.	1	2	3	4	
Category specific to your topic	1	2	3	4	
Category specific to your topic	1	2	3	4	
Total Score					0

Appendix 3. Flash Team Rubric

ACTIVITY	Exemplary	Proficient	Partially Proficient	Incomplete	POINTS
Script/ Storyboard	**4 points**	**3 points**	**2 points**	**1 point**	
	The storyboard illustrates the podcast structure with thumbnail sketches of each scene. Notes of proposed transition, special effects, sound and title tracks include: text, background color, placement & size of graphic, fonts – color, size, type for text and headings. Notes about proposed dialogue/narration text are included. All sketches are numbered, and there is a logical sequence to the presentation.	The storyboard includes thumbnail sketches of each scene and includes text for each segment of the presentation, descriptions of background audio for each scene, and notes about special affects and dialogue. All sketches are organized and numbered in a logical sequence.	The thumbnail sketches on the storyboard are not in a logical sequence and do not provide complete descriptions of the scenes, audio background, or notes about the dialogue. All sketches are organized and numbered in a logical sequence.	There is no evidence of a storyboard.	
Presentation Skills	**4 points**	**3 points**	**2 points**	**1 point**	
Content					
	The content includes a clear statement of purpose or theme and is creative and compelling. The content is relevant to the message and the message is clearly understood. The genre is clearly recognized.	The content includes a clear statement of purpose or theme and is creative and compelling. The content is relevant to the message, but its presentation creates confusion in the message. There is some difficulty in identifying the genre.	The content does not present a clearly stated theme, is vague, and some of the supporting information does not seem to fit the message. Unable to identify the genre.	The content lacks a central theme and clear point of view. Much of the supporting information is irrelevant to the overall message. The viewer is unsure about the message. Information is incomplete, out of date and/or incorrect. Cannot identify the genre.	

Organization					
	All scenes flow smoothly and are in logical order.	Most scenes flow smoothly and are in logical order.	Appears as a disconnected series of scenes with few scenes in order.	The content lacks a logical sequence of information.	
Pace					
	Clips are just long enough to make each point clear. The pace captures audience attention.	Most scenes move at a steady pace, fast enough to keep the audience interested and slow enough to tell a complete story.	Scenes are used but need to be edited in length or move too quickly to assist in telling the story.	Scenes are too long and do not advance the storyline or to short and leave out essential action or dialogue.	
ACTIVITY	**Exemplary**	**Proficient**	**Partially Proficient**	**Incomplete**	**POINTS**
Design	**4 points**	**3 points**	**2 points**	**1 point**	
Color Scheme					
	In all scenes the color scheme for backgrounds, etc. sets the mood of the podcast perfectly.	In most scenes the color scheme used for backgrounds, etc. enhances the presentation.	In most scenes colors used for backgrounds, etc. distract from the presentation and are not suited to the mood of the podcast.	No color scheme is apparent.	

Graphics					
	The graphics and/or animation assist in presenting an overall theme that appeals to the audience and enhances concepts with a high impact message. All multimedia elements work well together and demonstrate excellent synthesis. All graphics are highly creative and explain and reinforce key points during the presentation.	The student uses proper size and resolution to create images. The graphics, and or animation visually depict material and assist the audience in understanding the flow of information or content. Most of the graphics are highly creative. Multimedia elements are appropriate and enhance the presentation.	Some of the graphics, and/or animations seem unrelated to the topic/theme and do not enhance concepts. Images are too large/small in size. Images are poorly cropped or the color/resolution is fuzzy. Few images are highly creative. Multimedia elements support the presentation occasionally.	The graphics, and/or animations are unrelated to the content. Graphics do not enhance understanding the content, or are distracting decorations that create a busy feeling and detract from the content.	
Moving Images					
	Motion scenes are planned and purposeful, adding impact to the story line. "Talking heads" scenes are used when crucial to telling the story.	The podcast includes some "talking heads," and backgrounds. Most motion scenes make the story clearer or give it more impact.	The podcast includes "talking heads" and a few motion scenes are added but do not improve understanding of the story line.	The podcast features "talking heads" with little or no action to add interest or the video uses action excessively.	

ACTIVITY	Exemplary	Proficient	Partially Proficient	Incomplete	POINTS
Sound/Audio					
	The sounds enhances concepts with a high impact message. All multimedia elements work well together and demonstrate excellent synthesis. All sounds make the scenes more realistic.	The, sounds assist the audience in understanding the flow of information or content. Most sounds fit the scenes. Multimedia elements are appropriate and enhance the presentation.	Most of the sounds seem unrelated to the topic/theme and do not enhance concepts. Multimedia elements support the presentation occasionally.	The sounds are unrelated to the content. Sounds do not enhance understanding the content, or are distracting decorations that create a busy feeling and detract from the content.	
Programming Skills	**4 points**	**3 points**	**2 points**	**1 point**	
	Can easily recognize use of Actionscript in scenes. Use of buttons is easily recognized.	Some evidence of use of Actionscript. Use of buttons easily recognized.	Very little use of Actionscript. No buttons used.	No Actionscript and no use of buttons.	
				Total Points	16 max

Appendix 4: Launch-IT Feedback Means

Fall 07- Spring 2008

How satisfied were you with the following activities in today's session?
Code for Satisfaction: 1=Not at all satisfied; 2=A little satisfied; 3=Pretty satisfied, 4=Very satisfied

All Students

	10/13	11/12	12/8	1/26	2/16	3/15	4/19	5/10
Working on the computer	3.6	3.7	3.6	3.7	3.7	3.5	3.7	3.8
Learning about computer	3.3	3.5	3.5	3.4	3.6	3.4	3.4	3.7
Doing Schoolwork w/ tutor	3.2	3.3	3.6	3.5	3.7	3.1	3.3	3.2
Outside speaker	3.1	3.5	3.4	3.1	3.4	3.2	3.3	3.3
Outside activity	3.5	3.5	3.4	3.4	3.6	3.5	3.7	3.8
Food	3.4	3.6	3.6	3.7	3.8	3.5	3.7	3.8
Bus Service	3.4	3.1	2.9	3.2	3.6	3.3	3.2	3.4

Robotics

	10/13	11/10	12/8	1/26	2/16	3/15	4/19	5/10
Working on the computer	3.6	3.6	3.6	3.7	3.7	3.3	3.7	3.8
Learning about computer	3.2	3.4	3.5	3.2	3.6	3.1	3.4	3.6
Doing Schoolwork w/ tutor	3.3	3.3	3.5	3.2	3.7	3.1	3.2	3.2
Outside speaker	3.2	3.4	3.4	2.8	3.4	3.0	3.3	3.3
Outside activity	3.7	3.8	3.6	3.5	3.8	3.5	3.6	4.0
Food	3.4	3.6	3.7	3.7	3.8	3.6	3.8	3.8
Bus Service	3.4	3.2	3.2	3.0	3.6	3.1	3.6	3.5

Flash

	10/13	11/10	12/8	1/26	2/16	3/15	4/19	5/10
Working on the computer	3.7	3.8	3.6	3.9	3.6	3.8	3.7	3.9
Learning about computer	3.4	3.5	3.5	3.6	3.5	3.8	3.3	3.7
Doing Schoolwork w/ tutor	3.2	3.4	3.7	3.6	3.8	3.4	3.5	3.3
Outside speaker	3.1	3.6	3.4	3.3	3.4	3.3	3.5	3.0
Outside activity	3.3	3.0	3.3	3.3	3.3	3.4	3.8	3.6
Food	3.5	3.6	3.7	3.9	3.9	3.8	3.6	3.9
Bus Service	3.5	3.1	2.8	3.3	3.7	3.7	3.0	4.0

Java

	10/13	11/10	12/8	1/26	2/16	3/15	4/19	5/10
Working on the computer	3.4	3.9	3.3	3.3	4.0	3.4	3.8	3.7
Learning about computer	3.4	3.9	3.3	3.1	4.0	3.3	3.8	4.0
Doing Schoolwork w/ tutor	3.3	3.3	3.2	3.6	3.8	3.0	3.5	
Outside speaker	3.0	3.6	3.1	3.5		3.4	3.0	
Outside activity	3.2	4.0	2.7	3.5		3.4		
Food	3.1	3.3	2.7	3.5	3.5	3.2	3.6	3.7
Bus Service	3.3	3.0	2.5	3.2	3.0	3.1	2.0	

Appendix 5: Computer Attitude Questionnaire Indices and Reliabilities

Code: 1=Strongly Disagree; 2=Disagree; 3=Undecided; 4=Agree; 5=Strongly Agree

Computer Importance α = .720

3. I will be able to get a good job if I learn how to use a computer.
6. I would work harder if I could use computers more often.
7. I know that computers give me opportunities to learn many new things.
8. I can learn many things when I use a computer.
10. I believe that the more often teachers use computers, the more I will enjoy school.
11. I believe that it is very important for me to learn how to use a computer.

Computer Enjoyment α = .711

1. I enjoy doing things on a computer.
2. I am tired of using a computer. (Reversed)
4. I concentrate on a computer when I use one.
5. I enjoy computer games very much.
9. I enjoy lessons on the computer.
12. I feel comfortable working with a computer.
13. I get a sinking feeling when I think of trying to use a computer. (Reversed)
15. Working with a computer makes me nervous. (Reversed)
18. Computers are difficult to use. (Reversed)

Study Habits α = .804

21. I study by myself without anyone forcing me to study.
24. I review my lessons every day.
25. I try to finish whatever I begin.
26. Sometimes, I change my way of studying.
29. I never forget to do my homework.
30. I like to work out problems which I can use in my life every day.
31. If I do not understand my teacher, I ask him/her questions.
32. I listen to my teacher carefully.
33. If I fail, I try to find out why.
34. I study hard.

Motivation/Persistence α = .729

21. I study by myself without anyone forcing me to study.
22. If I do not understand something, I will not stop thinking about it.
23. When I don't understand a problem, I keep working until I find the answer.
25. I try to finish whatever I begin.
27. I enjoy working on a difficult problem.
28. I think about many ways to solve a difficult problem.
29. I never forget to do my homework.
34. I study hard.

Lack of Computer Anxiety $\alpha = .834$

12. I feel comfortable working with a computer.
13. I get a sinking feeling when I think of trying to use a computer. (Reversed)
14. I think it takes a long time to finish when I use a computer. (Reversed)
15. Working with a computer makes me nervous. (Reversed)
16. Using a computer is very frustrating. (Reversed)
17. I will do as little work with computers as possible. (Reversed)
18. Computers are difficult to use. (Reversed)
19. Computers do not scare me at all.

NOTE: These questions were from the Computer Attitude Questionnaire in "Instruments for Assessing Educator Progress in Technology Integration" by Gerald Knezek, Rhonda Christensen, Keiko Miyashita, and Margaret Ropp. © 2000 Institute for the Integration of Technology into Teaching and Learning. University of North Texas, Denton, Texas, USA. ISBN # 1-931410-00-3, and were used with permission.

Appendix 6. Oneway ANOVA Post Hoc Analysis

Dependent Variable	Robotics or Flash or Java	(J) topic Robotics or Flash or Java	Mean Difference (I-J)	Std. Error	Sig.
Computer Importance	1 Robotics	2 Flash	0.00439	0.19040	0.982
		3 Java	0.04605	0.22783	0.841
	2 Flash	1 Robotics	-0.00439	0.19040	0.982
		3 Java	0.04167	0.23958	0.863
	3 Java	1 Robotics	-0.04605	0.22783	0.841
		2 Flash	-0.04167	0.23958	0.863
Computer Enjoyment	1 Robotics	2 Flash	-.44246(*)	0.18946	0.025
		3 Java	-.50000(*)	0.22417	0.032
	2 Flash	1 Robotics	.44246(*)	0.18946	0.025
		3 Java	-0.05754	0.22945	0.803
	3 Java	1 Robotics	.50000(*)	0.22417	0.032
		2 Flash	0.05754	0.22945	0.803
Study Habits	1 Robotics	2 Flash	-0.25749	0.23268	0.276
		3 Java	0.22039	0.27245	0.424
	2 Flash	1 Robotics	0.25749	0.23268	0.276
		3 Java	0.47788	0.29049	0.108
	3 Java	1 Robotics	-0.22039	0.27245	0.424
		2 Flash	-0.47788	0.29049	0.108
Persistence & Motivation	1 Robotics	2 Flash	-0.24092	0.25664	0.354
		3 Java	0.20139	0.29961	0.506
	2 Flash	1 Robotics	0.24092	0.25664	0.354
		3 Java	0.44231	0.31685	0.171
	3 Java	1 Robotics	-0.20139	0.29961	0.506
		2 Flash	-0.44231	0.31685	0.171
Lack of Computer Anxiety	1 Robotics	2 Flash	-0.63095	0.34410	0.075
		3 Java	-1.01042(*)	0.40538	0.018
	2 Flash	1 Robotics	0.63095	0.34410	0.075
		3 Java	-0.37946	0.41039	0.362
	3 Java	1 Robotics	1.01042(*)	0.40538	0.018
		2 Flash	0.37946	0.41039	0.362