
TWO YEAR EVALUATION STUDY OF THE TIGER WOODS LEARNING CENTER

VOLUME II

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EXECUTIVE SUMMARY

During the 2007-2008 school year, the Tiger Woods Learning Center (TWLC) created and implemented a new Day Program model for 5th-6th grade students, and also offered a Professional Development program for in-service teachers. This report represents a one-year study of the TWLC's new Day Program model and Professional Development program. The study was conducted by the University of California, Irvine, with support from the Charles Stewart Mott Foundation, as part of a comprehensive two-year evaluation study.

For its first two years, the TWLC has endeavored to meet the challenge of preparing youth for a promising future, based on the belief in the intrinsic assets of each young person and a commitment to cultivate their potential and support them toward reaching their educational and career goals. The TWLC sought to meet its mission through the implementation of two types of programs: a Day Program (Career Orientation Program), that serves 4th-6th grade students from local elementary schools; and an After School Program (Career Exploration and Career Preparation), that serves 7th-12th grade students.

The key characteristics of the TWLC approach are:

Assets Driven Approach: A focus on fostering developmental assets, including achievement motivation, school engagement, integrity, interpersonal competence, and positive relations with peers and adults.

Career Orientation and Preparation Focus: Course offerings and supplemental activities geared to providing youth with opportunities to explore career interests in science and technology fields and to practice related skills.

Science & Technology Emphasis: A science-focused curriculum and technologically rich infrastructure.

Exposure and Access to Golf: With the unique feature of its own golf course, the TWLC introduces golf to youth, many of whom would never have had that exposure.

Research Questions

The evaluation of the 2007-2008 Day Program, described in Volume Two, is part of the full two-year evaluation. The purpose of Volume Two was three-fold: 1) to document program implementation and experiences of student participants in the new model of the Day Program and in-service teacher participants in the Professional Development program, 2) to assess the effects of participation in the Day Program on students' attitudes toward science and their future outlook, and 3) to assess the effects of participation in the Professional Development program on

in-service teachers' attitudes toward (and efficacy in) teaching science. Data collection occurred from October 2007-May 2008.

Methodology and Data Sources

A research team composed of four University of California researchers and fifteen student assistants carried out the study over an eight-month period, using both qualitative and quantitative methods. The qualitative assessment was based on focus groups with Professional Development participants (in-service teachers); interviews with TWLC Day Program staff and observations of youth and staff in Day Program classes and enrichment activities; and collection and analysis of student-produced work, program documents, and curriculum materials. A total of ten formal observations of both student and teacher professional development programming were carried out and four focus group interviews were completed. Individual interviews of six TWLC staff who lead Day Program activities were carried out in February 2008 and the Program Director was interviewed in February and June of 2008.

Quantitative sources of data included pre- and post-participation surveys of Day Program students who participated in either one-week or two-week sessions, and pre- and post-participation surveys of in-service teachers enrolled in the Professional Development program. Surveys were administered to the students at the beginning and ending of each session by TWLC staff. Surveys were administered to the teachers in the Professional Development Program by UCI researchers, following a brief overview of the evaluation study, an explanation of the importance of the study to the TWLC, and an explicit confirmation that participation was voluntary and anonymous.

STUDY FINDINGS

Findings are presented in three parts, related to program implementation, youth outcomes, and professional development findings.

Implementation Findings

The goal of the Implementation Study was to document the quality of youths' experiences in the new model of the Day Program. Observations of the program and interviews with the students' teachers and the TWLC staff revealed two main findings regarding program implementation and student experience, both supporting the general conclusion that the TWLC had succeeded in designing and implementing a successful new model of the Day Program.

1. The TWLC staff and teachers in the Professional Development Program reported that the students were highly engaged in the activities, and were excited to be participating in the Day Program. On surveys, the majority of teachers (98%) agreed that the activities increased their students' interest in science, and over 70% of the teachers agreed that the students were able to see the relevance of these activities to "real life". One teacher wrote,

It was educational, enjoyable and engaging; they are excited about the activities they have done and have mentioned wanting to come back on their own.

Another teacher wrote,

Students were excited to attend every day and learned so much.

Observations of the class activities showed that TWLC's assets-driven program activities and youth development approach created a physically and emotionally safe environment for the students, promoting positive relations among peers. Students from different schools were placed together in TWLC classes, creating the opportunity for students to build relations across schools. However, the one-week format of the program and the large numbers of students in each class made it difficult for TWLC staff to develop supportive adult-youth relationships. As the following comments from TWLC staff illustrate,

If the room was bigger, I think honestly it would be better. I have six people around the table. The tables are too small for six people around the table, especially now they are all getting bigger and taller.

The biggest challenge, I'll have to say, is the class sizes. Especially in my classroom, it's just hard when there are more than 30-32 kids. It's really hard. We have six kids at a small table. There are bound to be issues.

Overall it's been, at first, a little challenging. Just having a new group of students every week or every two weeks... I wasn't used to that kind of system and, with that many students, it felt hard to build the relationships that I wanted to build.

I'll be honest with you by Thursday or Friday I didn't even know maybe five or six names. I couldn't identify my students. I would just point at them. Whereas with the other [three-week session], I grew a relationship with them.

Many schools returned for a second week, and students were assigned to the same TWLC teachers they had during the first week. Although the returning students' familiarity with the program afforded some benefit to the students and TWLC staff, there was a significant time lapse between the first and second weeks, from at least one month to as much as three months. This time lapse diminished some of the potential benefits of the two-week program. TWLC staff noted that it disrupted the development of positive relations, both among students from different schools and between youth and adults. Further, most students forgot much of what they had learned in the first week, so they could not immediately build on prior learning.

Finally, one more problem the TWLC staff conveyed was that the new two-week structure of the Forensic Science curriculum, with the culminating crime scene investigation at the end of the second week after several months of lapsed time between the first and second weeks, was "too much." In the view of some staff, it was difficult for students to connect the activities from months prior to the crime scene investigation. The length of time between the first and second week made the curriculum seem "broken up" and the kids forget what they had done during the first week, explained one staff.

Although the TWLC staff were concerned about the limitations of the briefer sessions, many of the visiting teachers commended the program as a both positive and worthwhile for their students, as evidenced by the following comments:

I think the staff was great! I saw many positive interactions between the children and staff.

Wonderful two weeks. Beautiful facility. Very positive and helpful staff.

This was an incredibly valuable experience and should be used as a model for the direction public education needs to take.

2. The TWLC program is housed in a unique and impressive facility. Several teachers commented on the positive effects of the facility's capabilities and atmosphere, with comments similar to the following:

Great experience for the kids, great golf exposure, super computer programs, nice variety of media use, very inspirational.

Everything about the way the building is designed to look like a college campus and feel like a college campus and they have all these great tools. Everything from being given more autonomy in the classroom like being handed the laptop and being told to go forward in a movie, and maybe not being as controlling as I might be. Just the way the teachers are with them is very empowering, and the expectations are very high.

Teachers also noted how the TWLC's focus on careers and higher education prompted youth to begin imagining their future. The program encouraged them to consider specific ideas and plans for college and careers, including the academic pursuit of science and the possibility of science-based careers. TWLC staff connected science content to real life, making it meaningful to the students. Teachers in the Professional Development Program commented,

They are all expected to be able to do certain things, and they do and they feel like "oh, this is what college is going to be like." It's very empowering.

Just applying it to real life and turning it into an actual career that they can have. Not making it seem like science is separate from the rest of your life, and shows how you can apply science in your daily life.

I thought the experience at the TWLC was great for the students because many of them have never had such an experience as this. It also gives them a chance to learn about careers they'd be interested in. It gives them hope for the future.

Youth Outcome Study Findings

A pre- and post-survey of participants in the Day Program was administered to assess the effects of TWLC participation on attitudes toward (and efficacy in) science, and future outlook. These two outcomes were selected after discussions with TWLC directors. Surveys to measure these

outcomes were based on questionnaires previously validated in national research on after school program outcomes. Three survey items were also included to determine whether program participation influenced students' intentions to return to the TWLC in the future (on Saturdays, or in the After School Program).

Pre-participation scores and post-participation scores were computed for the two outcomes, and paired t-tests were run to determine whether there were any significant change in the scores. There was a small but significant increase in scores for both outcomes. Overall, students reported greater interest in science, a greater sense of efficacy about science, and a greater sense of optimism about future success in school, career, and community.

Pre-Participation Scores, Post-Participation Scores, and Change Scores

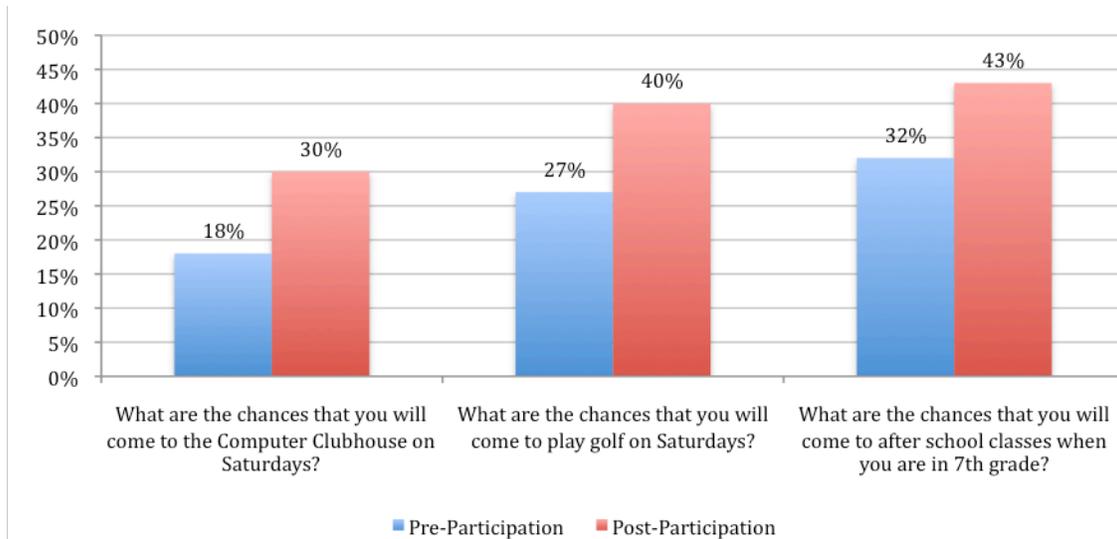
	Pre-Participation		Post-Participation		Change Scores	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Science Efficacy ¹	3.12	.53	3.22	.57	.10	.42
Future Outlook ²	4.48	.57	4.56	.56	.08	.46

¹ survey items were on a 4-point scale

² survey items were on a 5-point scale

Participation in the Day Program also had a positive impact on students' plans to return to the TWLC on Saturdays or for the After School Program.

Percent of students responding that chances were “high” or “very high” that they would come to the TWLC on Saturdays or for after school classes



Professional Development Program

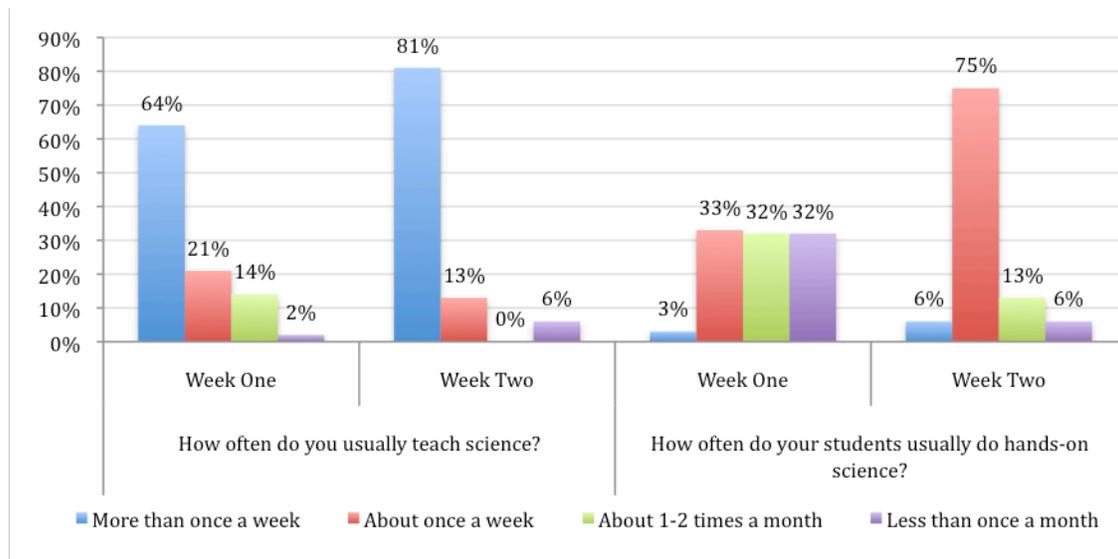
A pre- and post-survey of participants in the Professional Development Program was administered to assess the effects of the teachers' participation on attitudes toward (and efficacy in) teaching hands-on science, as well as assessment of the strengths and weaknesses of the program, and the perceived effects of participation in the Day Program on the students. Focus group interviews further illuminated teachers' experiences at the TWLC.

The surveys included items that measured three main constructs: Efficacy in Teaching Science; Importance of Science; and Views of Students' Capabilities. No changes in teacher views were detected.

In focus groups, teachers reported benefits of participating in the Professional Development program. Teachers found that the TWLC science workshops helped them with how to "explain difficult concepts" to students, and also served to "demystify science hands-on activities". Teachers also appreciated the clear and concise "review of science concepts" that they had "not heard in a long time," as well as the "great teaching tips" and "quick ways to implement thought-provoking experiences." One teacher remarked, "I am so excited to apply what I learned here and am ready to implement it."

Indeed, between the first and second sessions at the TWLC, teachers reported an increase in the frequency of actually teaching science in their classrooms, as well as an increase in the frequency of implementing lessons in which their students did more hands-on activities.

Figure 4.2: Pre-Participation Scores, Week One and Week Two



Teachers also reported a shift in their views of how to present the relevance of science to their students' lives and connection to potential careers. For example, one teacher commented,

I've always done hands-on activities and that's the part that they love the best. But I think specific career applications have been useful. So when I'm doing things, I'll be more like, 'you are a chemist and that's what you would be doing'. I think I'll be more apt to look through the eyes of a scientist. We can use it not just in science, but math, language arts, and everything.

Few teachers made suggestions for improvement to the TWLC program. The main theme among those teachers who suggested improvements was the need to more closely align the Professional Development Program activities and Day Program activities to the state content standards. One teacher stated specifically that there needed to be “more direct application to specific fifth grade standards in preparation for the 5th grade STAR Science Test”. A majority of teachers in the focus groups advocated that the activities absolutely needed to be more explicitly driven by the state standards.

Along the same lines, some teachers expressed some nervousness about the amount of time spent at the TWLC, if the content did not more directly and effectively address content standards. On surveys, however, it is important to note that the overwhelming majority of teachers (90%) disagreed with the statement “the time spent on these activities would have been better spent on other non-science curriculum.”

Other suggestions for improvement were actually requests for “a longer period”, “more often”, “more experiments”, and “just more!” The majority of teachers wanted to return to the TWLC for both the Professional Development Program and the Day Program (for their students), and felt the programs should be recommended to others. For example, teachers remarked,

I would love to come back next year for one or two weeks! Thanks for having us. It was very useful!

Let teachers know about this wonderful resource for our students. The TWLC is a gem. More kids need to know about it. I think more should be done to get the word out in the community to parents and teachers about what TWLC has to offer. I know many teachers who have said they would like to know more.

CONCLUSION

The original model for the TWLC Day Program, which has been implemented since the TWLC began operation, is three weeks long and recruits students who are “off track”, from year-round schools. As more schools in the Anaheim area transition to a standard school year calendar, fewer students will be able to participate in this type of program. The TWLC administration and staff have anticipated this problem, creating a new model for the Day Program that brings classes of 5th and 6th grade students to the TWLC for one-week sessions of science-based instruction. The TWLC augmented this model by offering a Professional Development program for the teachers of students participating in the Day Program.

During the first year of implementation, both programs were successful in meeting several goals. Surveys revealed that there were positive effects on students’ interest in science and their sense of efficacy toward science, as well as positive effects on their academic and career goals, and optimism about future success in life. Comments from teachers participating in the Professional Development Program, on surveys and in focus group interviews, consistently showed that the teachers believed their students had a very positive and valuable experience at the Center. Further, most of the teachers expressed the opinion that they had also enjoyed the program, had learned a great deal about Asset-based, hands-on science instruction, and were looking forward to implementing the TWLC activities in their own classrooms.

Throughout this first year of implementing these two new programs, the TWLC administration and staff continued to examine and revise aspects of the program, determining what changes might be made to improve the programs in the following year. Future evaluation efforts at the TWLC may help to determine the success of these changes, measuring the effects on participant outcomes in comparison to the first year of implementation, and also in comparison to the original three-week Day Program model.

SECTION I – INTRODUCTION

CHAPTER 1

INTRODUCTION AND OVERVIEW OF REPORT

This Volume II of the Two Year Evaluation Study of the Tiger Woods Learning Center presents study findings of the Career Orientation Program (COP) or Day Program, based on observations, interviews, and surveys carried out during the second year of the study (2007-2008). Included are findings that address a new Teacher Professional Development component in its first year of implementation in 2007-08. Data was collected during the period from October 2007-May 2008.

Chapter 2 reports qualitative data based on observations carried out during one week of the Marine Science module and the first and second week of the Forensic Science modules offered to 5th graders from local elementary schools primarily from two school districts, Magnolia and Anaheim City. During these same weeks, observations of the teacher professional development activities were carried out, and at the end of each observation week Focus Group interviews of participating teachers were conducted. Individual structured interviews of TWLC staff who lead the activities of the Day Program in Year Two were carried out in February 2008. The Program Director was interviewed in February and again in June of 2008. In these interviews, the Program Director and TWLC staff discussed their perceptions of the successes and challenges they experienced implementing the Day program's new Marine Science one-week and Forensic Science two-week sessions, as well as the new Teacher Professional Development component.

Chapter 3 reports the results of a quantitative survey data of students who participated in either the one-week Marine Science or two-week Forensic Science modules. TWLC staff administered pre- and post-surveys to Day Program students about their attitudes toward learning and achievement in science, toward college and career goals, and toward the prospect of participating at the TWLC in the future. The chapter also reports survey findings of the teachers who participated in the Professional Development workshops in Year Two of the study.

Chapter 4 reports findings from pre- and post surveys administered by UCI researchers to teachers participating in the Professional Development workshops regarding their attitudes toward science instruction and learning, their perceptions of professional development activities, and their students' experience at the TWLC. The surveys were developed after consulting with TWLC administrators in August 2007 to determine the desired outcomes they aimed to achieve with the new Day Program modules and Professional Development Component. (See Appendix B.1 and B.2 for sample surveys and interview questions, and B.13 for summary of data collected).

SECTION II – IMPLEMENTATION STUDY

CHAPTER 2

CAREER ORIENTATION AND PROFESSIONAL DEVELOPMENT PROGRAMS

This chapter presents findings of Year Two of the Tiger Woods Learning Center’s Career Orientation Program (COP), or Day Program, and a new Teacher Professional Development component that was in its first year of implementation in 2007-08. Teacher Professional Development activities occurred at the same time that the student COP program operated, Mondays through Fridays from 8:30 am to 2:00 pm.

This chapter reports qualitative data based on observations carried out during the Marine Science and Forensic Science modules offered to fifth graders from local elementary schools. Observations of program activities were carried out during the first and second week of a Forensic Science module (November 26-30, 2007 and April 28-May 2, 2008) and a one week Marine Science module (March 31-April 4, 2008). During these same weeks, observations of teacher professional development activities were carried out and at the end of each observation week Focus Group interviews of participating teachers were conducted. A total of ten formal observations and four focus group interviews were completed. Individual structured interviews of TWLC staff who lead the activities of the Day Program in Year Two were carried out in February 2008. The Program Director was interviewed in February and June of 2008.

YEAR TWO CAREER ORIENTATION PROGRAM

As indicated in Volume I of this report, because of changes in the school calendars in surrounding school districts, from year-round to traditional nine-month academic year schedules, TWLC administrators were required to rethink the structure of the Career Orientation Program, which in its first year had served 4th-6th grade students who attended a three-week Forensic Science and Enrichment Program at the Center during the weeks that they were off-track from school. Since there would no longer be a group of students out-of-school during the course of the academic year, in spring of 2007, the COP program director in collaboration with partner school districts (Magnolia and Anaheim City) began to redesign the program to accommodate students during the regular 9-month academic year.

A TWLC staff member who had a background in biology was charged with developing a one-week curriculum module to accommodate the changed structure of the program and to offer a more diversified curriculum. The Marine Biology and Forensic Science one-week and two-week modules were organized around a select set of hands-on science activities carried out during the first three hours with a half hour of assets activities following lunch and an hour enrichment class time in the afternoon. Students attended one enrichment class during their one-week stay (those who returned a second week got exposure to another enrichment class). The enrichment classes offered were Robotics, Creative Writing, Performing Arts, Graphic Art, and Engineering, with each class allowed to experience Golf on a designated day during the week.

The box below narrates the experience of students and teachers arriving at the TWLC for their first of two one-week Forensic Science modules.

DAY PROGRAM WELCOME AND ORIENTATION

Two buses arrive and some two hundred fifth grade students enter the TWLC building on a fall morning. Many look around in awe as they enter the building. There is evident excitement among the students who will be attending the Career Orientation Program at the TWLC for one week instead of their regular classes at their school site. Six teachers from their schools accompany them. The auditorium is full nearly to capacity as students take a seat.

The TWLC Program Director welcomes the students and provides them with a brief overview of the rules and expectations. The Director explains what the TWLC is about helping them to be more aware about careers and to get them excited about science and learning. She asks students, “What is a career?” Several raise their hands and offer explanations alluding to a career being something you do for a living over time and recognizing that you need to attend college to achieve your career goal. The Director then introduces the theme of the module they are about to undertake, Forensic Science, as one career option. She asks the students if they know what a Forensic Scientist does. Several children are able to provide examples such as investigating a crime scene, taking fingerprints and figuring out who committed a murder.

The Director then talks to the students about how it is their responsibility to help preserve the Center in the condition that they find it so that other youth can come and enjoy it like them. She takes some questions from the students. One asks if they will get to play golf. She tells them that they all will have that opportunity for one hour this week and another the next time they come in the spring. The students are called up in groups as they are assigned to their respective TWLC classes for the week. As each class of approximately 30 students is complete, the TWLC Learning Facilitators (LF) lead their classes one by one out of the auditorium to their respective classrooms where they will begin the Forensic Science module. The teachers head off to the Computer Clubhouse where they, like their students, will engage in hands-on learning experiences through professional development workshops on Physical Science activities and assets development. (November 26, 2007)

Marine Science One-Week Module

In order to expand the Day Program curriculum options, the TWLC developed a Marine Science module for implementation in Year Two. The COP Program Director explained the rationale for developing a new curriculum on Marine Science.

I think because of this area only being six or seven miles away from the beach and knowing the kids in this community aren't able to go to the beach, never even experiencing beach, I thought it would be kind of fun. Plus animals and sea life are always kind of fun for kids too. Forensic science is great and it's a hot topic, but I just thought marine science would be another cool idea especially since we were so close to the beach.

—Interview, February 2008

A TWLC staff with a B.A. in Biology was enlisted to draft the curriculum with support from the Ocean Institute in Dana Point. The curriculum was piloted in August of 2008 and other TWLC staff, working in the Day Program, had the opportunity to give their input during its initial implementation phase in the fall of 2008. In an interview at the end of the program year, the Program Director, Gyla Bell, reflects on the process of further developing the new curriculum model over the course of the year.

In the sense of curriculum, I think we really grew with the Marine Science. The first couple of times we taught it, I think it was in the molding phases. But I think by January we had all the nuts and bolt solid, and we were able to go with it. It just got better and better.

—Interview, June 2008

In one of the TWLC classrooms, a bulletin board displayed pictures of youth engaged in each of the activities they did during the week with these brief explanations: “We made models of the Earth’s Layers and learned how mountains and volcanoes are formed by plate tectonics”; “We looked at live plankton through a microscope and learned their important role in the food chain and photosynthesis”; “We dissected a crayfish and mackerel and compared their organ systems to the human body”; “We built a mini-ecosystem called an aqua-terrarium. We learned how life is sustained in both terrestrial and aquatic environments.”



As a culminating project of the Marine Science module, students captured what they learned during the week by creating posters about different regions of the ocean. A TWLC Learning Facilitator explained what the project involved and how students were motivated to work on their posters:

They pretend they are real estate agents. They have to learn different regions of the ocean and they have to sell [that region]. We give them these posters and they do research online. Then they make these posters such as ‘Coral Reef for Sale.’ They talk about temperature, the lights, what kind of animals are found there, how colorful [are the fish], can they produce light or what not. That is an all-day project. In fact [during the robotics] enrichment, I have had a couple of times students come back to the classroom and they don’t want to go back to their robots because these posters are not done yet. This is the last day here and some would rather sit in the back [and work on their posters]. I do give them the option, “Do you want to finish your posters or do you want to go outside and race [your robots]?” There have been times that they will be sitting back there and working on their posters because they want to finish this for sale poster and take it back to their class rooms.

—Interview, February 2008

From the perspective of some TWLC staff, the Marine Science module was more engaging for students, and for them, than the Forensic Science module, as expressed in this comment:

I'm really enjoying it. The Marine Science is a lot of fun. So, overall, I think it's going very well... I think it comes more from my background, I guess. I have always been interested in Marine Science. I actually wanted to be a Marine Biologist since I was 6 or 7. I think that the videos that we watch give them a good visual experience, and then they can do their hands-on activities. I think it's more engaging, and the students tend to like it a bit more than the Forensic Science. It's not as abstract. I think they really do [enjoy it]. On Friday, they are sad to go. This is always a good sign.

—Interview, February 2008

The following vignette describes a Marine Science fish dissecting activity and the high level of engagement of students. TWLC staff guide students during the activity to facilitate their learning as they work collaboratively in groups to explore new science content and develop scientific inquiry skills.

DISSECTING FISH: A MARINE SCIENCE EXPERIENCE

In one of the TWLC classrooms, a group of 5th graders wearing rubber gloves squeal and act squeamish about dissecting the fish laid out on each table in a tin tray. The students' task is to dissect the fish's heart. Students work in groups of four on a single fish. Though a few turn away in disgust, others gladly take the cutting tool in hand and proceed with seriousness.

The students are excited about dissecting fish as part of this one week Marine Science experience at the TWLC. Boys and girls interact vying to take the lead in the activity. The students negotiate who is going to do what. One boy yells out in excitement "It is like we are giving surgery to a fish," as he eagerly assists another boy in his group by pulling back the outer layer of skin to remove the heart.

The Learning Facilitator, a young TWLC male staff, leads the group with a calm and patient demeanor. He asks them, "What system is the heart a part of?" Some of the students respond confidently, "circulatory". The Learning Facilitator expands, "Yes, circulatory, but what other parts of the fish are part of the circulatory system?" He pauses and allows the students to call out the answer: "Gills!" "Right the gills are like the lungs of the fish, they extract oxygen out of the water like our lungs take it out of the air," he reminds the students who continue dissecting other organs out of the fish. The Learning Facilitator diagrams this dissecting process step by step on the Smartboard at the front of the classroom; each step is illustrated with photos.

As students proceed with the dissection, they call out the fish organs they discover: "I think these are the brains." "I found an artery." "Let me see what that is... I think I found the kidneys." The Learning Facilitator is very calm and proceeds with an interactive approach. Despite the students' excitement, he is able to effectively prompt students to think and recall information he has taught them in the context of the dissection activity. Students are practicing scientific skills and reviewing content learned in the one-week Marine Science module. The activity is highly engaging and allows students to experience success in a real life science activity. (April 4, 2008)

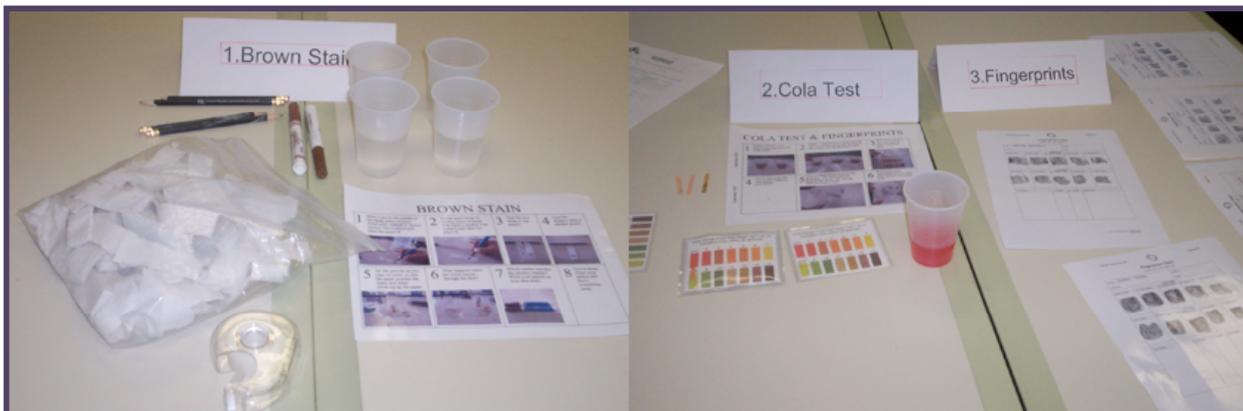
Forensic Science Two-Week Module

For those schools participating in the two-week Forensic Science program, fifth grade students were able to experience a range of science activities drawn from the original three-week Forensic Science Curriculum and assets activities over the two separate weeks that they attended the Center. Since these students returned for a second week of programming, they were able to do more than one enrichment activity in addition to one more hour of golf.

In developing the two-week module, staff determined which activities were key to completing the culminating crime scene investigation that took place at the end of the second week (instead of the third), as well as which were most engaging for students based on their 2007-08 experience. As such, during the first week of Forensic Science, fifth graders learned to use microscopes, did a scavenger hunt, learned to use Faces software to make a mock wanted poster, and performed several of the Forensic Science experiments such as Chromatography, Shoe Prints, Handwriting Analysis, Forgery, and Counterfeit.

During the second week, students continued to carry out another set of Forensic Science experiments, including Fingerprints, Mystery Fiber, Hair Analysis, DNA Extraction, Gel Electrophoresis, Mystery Liquids, and Mystery Powders. These hands-on science activities prepared them for the culminating Crime Scene Investigation which they completed on their last day, when they also had a group discussion about “Who Done it?” and heard the “Final Story” about what actually happened in the crime.

Observations of the two-week Forensic Science Crime Scene Investigation culmination activity indicated how the TWLC staff had systematically set up the crime scene lab. The science experiments in the room were very well organized. Printed signs with bold large black type letters indicated each forensic science lab experiment students had to complete for the crime scene investigation. Each station had laminated colorful printed instructions that included photos illustrating the steps for the corresponding experiments. These materials provided much clearer instructions than previous loose-leaf handouts that were used in Year One.





Observations indicated that students were highly engaged looking at the evidence at the mock crime scene created by the TWLC staff. Students were observed analyzing the evidence and applying the skills acquired in the hands-on experiments they had conducted during the previous one-week session and the days leading up to the culminating activity during the second week.

Everything that we teach them, there is a bigger idea. We tell them when you arrive here Friday there will be a crime scene and everything that you learned here will help you solve this crime and that's why they are excited about this material, because they are excited about Friday.

—Staff Interview, February 2008

Assets Development and Career Orientation

Although the Day Program one-week modules, adopted in Year Two, allowed less time to engage in specific Assets activities, staff continued to integrate key activities that they had carried out with success during the previous year. During the one-week program, students engaged in a half hour of Assets activities each day. On their first day they did a reflective self-identity activity starting with “Who is Tiger?” and “Who am I?” They were introduced to the 40 Developmental Assets on the second day. On the third day they engaged in a career awareness activity to help them to start defining their future goals [see box below]. On the fourth day, they explored the definitions of role models and leadership through two Assets activities: “Who are your role models (4 Corners)”, and “Qualities of a Leader”. On their last day they focused on developing a positive self image with the “What’s Great about Me!” and “Compliments on the Back” activities. Although there was no time for students to develop their own PowerPoint slide presentation during the one-week program, these shorter activities focusing on career goals and other developmental Assets enhanced students’ one-week experience at the center.

The two-week Forensic Science classes did similar activities with the addition of team building activities to prepare them for the Crime Scene Investigation. During the second week when they returned to the Center, students had the opportunity to practice group communication and collaboration skills through activities such as “Strike a Pose” where a student is blindfolded and has to listen carefully to their peers’ directives as to how to position their bodies, hence practicing how to pay close attention to every detail. Other activities included, “Goals II”, “Safe or Not Safe” and “Bullies”. Students learned basic Power Point presentation skills in the first

I like the exposure that our kids are getting with different career possibilities, or just what's really out there in the world. How things are made, who is involved in each step of the process. I think it's important for them to realize that, and they seem to really enjoy it.

—5th grade Teacher

week and were able to apply these skills during their second week by creating individual “All About Me” PowerPoint presentations. Youth attending the two-week program also were given a 1-hour Hispanic Scholarship Foundation Presentation on career awareness.

A teacher returning for a second week with her students in spring 2008 had this to say about the influence she perceived the career orientation and the science focus of the TWLC curriculum had on her students:

The kids are thinking beyond high school. They are thinking college, and careers. They are thinking about their future, and the consequences of their actions. They are relating what they do now to the future, whereas before they didn't care. [The TWLC starts them thinking by] talking to kids about what they want to do when they grow up. They talk about careers they never even knew existed, and how science is very cool. It's something that they didn't know they used every day. The way that it was presented to them here maybe showed them that it is used in everyday life.

—May 2008

The following vignette illustrates a Day Program activity that prompts students to think about their future career options.

IMAGINING FUTURE CAREERS

The classroom is filled to its maximum capacity with a largely Latino group of 5th grade students. The Learning Facilitator (LF) stands at the white board telling the students the story of her own career path. She graduated from high school and went to a community college for two years and then transferred to California State University, Long Beach and completed a Bachelor in Science. As the LF tells them her story and her future goals, the COP program students listen attentively.

The LF asks the children to share their career objectives. She calls on them as they go around the room. One student calls out that he wants to be a “meteorologist.” Others add to the voices of professional titles that students hold as their career objective: “family doctor”, “oceanographer”, “forensic scientist”, “teacher”, “oncologist”, “archeologist,” “artist”, and “nurse” are some of the answers provided.

The LF then asks the students, “Do you know how you plan to get there?” She pauses and then adds, “First you need to imagine yourself as what you want to be.” This leads into their next activity, which is to draw a self-portrait in their dream career. Students get to use digital pictures that the LF has taken of each of them and printed out in color. She tells them that they are going to draw themselves in their future career of choice and cut out their face from the digital photo to paste it on the body in their drawing.

As the LF passes out the pictures and paper for the activity, the students get excited, sharing their digital photos, laughing, and talking about the different careers they plan to pursue when they grow up. The LF emphasizes that they need to draw not only themselves in their future professional role, but the place where they would work, the surrounding environment. She gives them an example, “If you are going to be a teacher, what is in the classroom?” Students suggest, “a desk,” “a chair,” “a blackboard”. The students converse in an animated fashion about their career aspirations as they draw themselves into their future professional roles. A boy asks out loud, “How do you spell ‘oncologist?’”

(April 29, 2008)

TWLC Staff Perceptions of Year Two Program Implementation Experience

Day program staff were interviewed in February 2008 about their experiences implementing the one-week and two-week Science Modules. Staff offered their perspectives on the students' experiences and identified challenges they faced as Learning Facilitators within the new program structure. The Day Program Director offered this general assessment of the Year Two program implementation experience:

I think this past year went really well with bringing the 5th grade classes. The teachers, for the most part, loved their experiences here. The kids had a great experience here. The teachers loved to see their kids in a different environment—in a different learning environment—and actually experiencing a specific science related field (like Marine Science or Forensic Science). I've gotten great feedback. One school did not want the program at all, but that's fine. But all the other schools loved their experiences here. They would love to come back. I think I know my staff really enjoyed the two weeks too. Half the one-weekers loved it. There were some schools that came for one week that wanted to come for two weeks.

—June 2008

In general the staff reported that students responded positively to the Day Program curriculum. Staff were able to implement various strategies to keep students engaged during the one-week sessions, focusing specifically on developing students' science inquiry skills, “taking notes”, “recording data”, “comparing and contrasting, being detailed,” helping to build in them a sense of competence and interest in learning about science.



I really think what they take away from here is a different style of learning. The kids are excited about the learning with the group work. They are not sitting in front of the desk. They are touching, they are getting up, they are using computers, they are using a microscope. I think that's the biggest thing they are taking away.

Staff also commented on how the Day Program experience serves to expose students to the opportunities available on Saturdays for students to come to the Center and to recruit students into the After School Program.

Along these lines, a teacher in a focus group interview commented on how the Day Program generated in her 6th grade students, who participated in the Year One Day Program, interest in returning to the Center in 7th grade:

I have my sixth graders came on off track, but there was almost every sixth grader I had last year, or fifth grader when they were off track. They loved it and some of them still come and they talk about it. I know some of them want to know about your summer program for seventh grade. Last year somebody came and talked to us about a summer program for sixth graders entering seventh grade.

—April 2008

A teacher returning for a second week suggested the following ways TWLC staff could outreach to students at their school:

The kids absolutely love these teachers. They love knowing that the teachers come from here. Seeing them on our campus on a regular basis, just stopping in, would help bring the kids back in junior high and in high school. When they come to our schools [they could] keep them informed about things going on during the weekends, like bringing flyers. We don't get them delivered to our kids at school about [TWLC] activities. If one of these teachers came out like every three months, once a year, twice a year and we got flyers on upcoming Tiger Woods Center events...to get them to our schools more often, and to build a relationship that the kids would continue to come here later on.

—May 2008

Challenges Implementing the New Day Program Structure

Staff faced different challenges with the new program structure in Year Two. In interviews, staff identified several challenges they experienced with the new program schedule of one-week modules compared to the three-week modules they enjoyed during Year One. Most staff understood that the change was necessary to accommodate conditions that were out of the Center's control. Still, their primary concerns revolved around how the resulting limited time with students and increased number of students per classroom impacted the quality of the TWLC experience for Year Two participants. For example, one staff person expressed this view in the following way:

It's going well. I mean, obviously compared to what we had the year before with the fifteen-day program, it's a lot different. But, for what we are working with, everything is going ok. It's not ideal but it is what it is, with just one week...the amount of kids...compared to how it was the first year with fifteen days [and only] 24 students [per class]. It was quite nicer, but at the same time, like I said, I don't really know what other options there are. [You need to] make do with what you have...what else can we do? Not have a program?

TWLC staff pointed to an increase sense of “burn-out” they experienced in Year Two as a result of repeating the same curriculum from one week to the next.

This is a new model we have gone from year round to single track. I have seen teachers during the first three, four weeks, just dreading it, because it's one week after the other. Once a group would leave another group would come and they would do the exact same Forensic Science week-one activities over and over again. What is dreadful to think is how are we going to change this for the following year. We are piloting this model. A suggestion was to have all one-week sessions. I don't think that would be a good idea. I think we would lose a lot of our great instructors if we do that. It would burn everybody out. ... I remember the first three or four weeks in the beginning of the year was pretty hard. It really put a strain on a lot the instructors. Once we got the Marine Science going they are more comfortable with that now.

One staff suggested that one way to remedy the issue of “burn-out” would be to offer a greater variety in the modules in order to make it more interesting for the Learning Facilitators charged with delivering the curriculum:

I would change part of the curriculum for the ones who have been here for a long time. Probably we would want a new curriculum for next year just ‘cause Forensic Science, it’s interesting, but I think for most of us who have done it for so long it would be nice to have a new curriculum.

The larger number of students per class also was a negative factor for several TWLC staff. Staff pointed out that the classrooms were not designed to accommodate 35 students. One staff member stated that the combination of a more crowded classroom space and reduced time made her “feel like a dictator” as she had to “push through” the week,” and keep order in an over crowded classroom which this staff person described as “horrible.” The staff person felt that these changed conditions compromised the quality of the program: “We’re supposed to be different here, to create a different learning environment.” Other staff agreed on the negative impact of these changed conditions:

If the room was bigger, I think honestly it would be better. I have six people around the table. The tables are too small for six people around the table, especially now they are all getting bigger and taller.

The biggest challenge, I’ll have to say, is the class sizes. Especially in my classroom, it’s just hard when there are more than 30-32 kids. It’s really hard. We have six kids at a small table. There are bound to be issues.

The only negative thing is the classroom size. I think that is the biggest issue that I have with the program and also the turnover rate. But I don’t know if that can be changed. I think if we could reduce class sizes a little bit and keep the students here a little bit longer, and then we wouldn’t have to rush through. Other than that it’s been a great experience.

Despite these logistical challenges, staff gave a generally positive assessment of the Year Two day program experience, but all spoke to missing the three-week program and the greater opportunity it afforded them to bond with students. They argued that that the one-week module is too fast-paced, which cuts down on the time to get to know the children, to just “hang out with the kids”, and build a relationship with them. There is not enough time for “community building”. Several staff elaborated on this key aspect of program quality:

I think we still are building relationships but it’s hard to build one in just one week and I feel that when they leave they are gone. And I feel three weeks is just longer to build a stronger relationship basically.

Overall it’s been, at first, a little challenging: just having a new group of students every week, or every two weeks. I wasn’t used to that kind of system and, with that many students, it felt hard to build the relationships that I wanted to build. But now I’ve gotten used to it. I’ve gotten a lot better, in one week, to building the kind of relationships that I want to build. So, overall, I think the program is going very well.

I'll be honest with you by Thursday or Friday I didn't even know maybe five or six names. I couldn't identify my students. I would just point at them. Whereas with the other [three-week session], I grew a relationship with them ... I like the material, I like what we are doing with the Forensic Science. I am very passionate with the subject and that makes it fun for me. But when it comes to building a relationship with the students I think it is really hard.

I feel like I'm on repeat like I have to give them my expectations and they have four days to uphold them and they're gone. One thing I have noticed since we had two groups that came back [for their second week], they kind of catch on really quickly. As soon as I see faces, I remember the experience they had before and you know you always think of the negative and it's good to see that some changed and they knew how they acted the first time and how certain things got taken away from them, like a laptop or certain privileges that they had, they were different the second time. So that was a good thing I thought that was something that I observed. But just the receptiveness and the quickness of it are really hard to uphold all the expectations especially with the fact that the kids are all excited to be here.

As indicated by the above statements, staff felt that the lack of opportunity to connect with students was having a negative effect on the quality of their own experience as Learning Facilitators. As one staff person stated, "It's the reason I love working here. I get students to feel good about themselves."

With the more crowded conditions and shorter time to establish relationships with students, more behavior problems emerged, according to staff who reported that students exhibited negative attitudes more often in Year Two as compared to their experiences with students in Year One. One TWLC staff explained that some students expected the TWLC instructors to take on the authoritative role of teachers at their school since they were coming to the Center during school time as opposed to being "off-track" or on vacation: "I started to be like a regular teacher." Another staff echoed this perception that the students brought with them a certain set of expectations from their school environment which affected their behavior at the Center.

These kids were good kids, [with] a lot of energy, but I think their school environment reflected on how they worked. They did not follow directions and they just could not listen for the life of them and I think that's part of their school, their expectations, they haven't had that training or that conditioning for them to be like 'OK, we need to listen and we need to follow directions.'

One TWLC staff explained, however, that despite the range of attitudes from the groups attending the Center, they were able to establish a different set of expectations during the students' weeklong stay:

I think it always goes back to their situation, their background. If the student is doing well in school, and has good support family-wise, they come here and they're going to have a positive attitude. Students that do not have the same support or have disciplinary actions back at school, are going to come in here with a different outlook. I guess our goal is to try to change that a little bit. Overall, the ones that have a negative outlook coming in do start to change throughout the week. I think the biggest problem a lot of them have is the note taking, which is something they are probably not

familiar with. Hopefully, they kind of get used to it by Friday. By Friday, most of them have a positive outlook.

Similarly, another TWLC staff talked about working to ensure all students are engaged despite the challenges presented by the new program structure and larger number of students, and need to accommodate more English language learners:

I think the kids, for the most part, can understand what is going on here. We try to simplify it as much as possible. For those who don't want to, there are a lot of reasons. I always try to approach it right away. Because if I don't see a student [engaged], if he's not into it or she's not into it, I am going to stop myself...because my job is for everybody, [and ask] "What's going on here?" Some of them, it's a language barrier, that's one of the hardest ones for me, so I always try to have them sit next to a person who speaks their language.

Other concerns staff expressed regarding the Day Program in Year Two were related to maintaining its distinctiveness from school. TWLC staff recognized that the students love the hands-on active learning and enrichment activities that they do during their week at the Center—especially the golf "that really excites them." They pointed to the challenge of finding the balance between making the TWLC experience fun and playful while engaging students in academically oriented work, as is the expectation of the participating schools and their teachers. The TWLC staff talked about how they strive to convey to students that "they are here to learn and that there are rules," while still maintaining a climate that is different than school.

Staff elaborated on the uniqueness of the TWLC experience for the youth who participate in the Day Program and their concern that the new structure may alter the nature of the program, moving it away from what they believe are its strengths:

It really is a lot different here (at least in the way I come about it) than it is for students at public schools because I think they do feel a more relaxed connection between themselves and the adults, which is great. I think this is less structured than a school environment. Every day they come in and there are completely different things that they are doing. So I think it is less structured. I think there is more time for them to express who they are. I think there are more adults that they can connect with or have relationships with besides their one teacher. They have teachers here and they have people outside always playing with them. They come back and they have another teacher here for enrichment. So I think they have more relationships here and they treat it a little more like a field trip, which is always fun for them.

I think they are exposed to a different learning style here and I think they really benefit from that. I think they are very excited to be here. I have heard teachers say they are not like this in their classroom, in their regular classroom. So I think that's very exciting, and all of the technology we offer here the kids are obviously excited about that... [In their classrooms at school] I think that they probably are more removed, they don't participate as much [because] they are not engaged, they don't act like they are engaged. I think we do a good job engaging students in the class.

Well they are [attending] a public school and they are coming here during their school time so we have to, I guess, uphold their standards they are trying to teach. So it does

leave me confused because we're suppose to be different than a public school but I feel like we are turning into a public school. This is my biggest concern... here we have the potential to offer really different environments but if we become so focused on standards and so focused on, learning, learning all day long and not have time to build relationships then we are doing a total disservice and are not doing what we are about.

Finally, one more problem that staff conveyed was that the new two-week structure of the Forensic Science curriculum, with the culminating crime scene investigation at the end of the second week after several months of lapsed time between the first and second weeks, was “too much.” In the view of some staff, it was difficult for students to connect the activities from months prior to the crime scene investigation. The length of time between the first and second week made the curriculum seem “broken up” and the kids forget what they had done during the first week, explained one staff.

In interviews, TWLC Day Program staff also commented on the presence of the teachers who accompanied their students to the Center and participated in the professional development sessions. A TWLC staff described how the attitudes of the visiting teachers varied in their observations of the classrooms: “some seem excited, some stand-offish, some don't even come, while others get involved.” Several staff stated that they perceived some resistance on the part of visiting teachers who conveyed the sentiment that they were wasting their time at the Center, as they perceived the TWLC curriculum as not addressing the grade-level standards on which students are tested. Staff noted that by the end of the week many teachers’ attitudes got “better,” as the teachers were able to observe their students engaged in a variety of skill building activities. TWLC staff shared these impressions of the teachers’ who visited their classrooms with the following statements:

For the most part, all the teachers have been great. They are always thanking us, and staying out of the way. Some of them observe very much, others don't as much; for the most part, the ones who come to observe [just] pop their head in for a minute or two. Occasionally, one out of four will come in and spend a good amount of time to see what we are actually doing and ask me questions.

The teachers are loving it... because they [know their students] are upstairs with our instructors keeping an eye on them; it is a relief that they don't have to be upstairs watching their students. They can do their own thing.

I don't feel like the teachers really are observing... I think they are more taking pictures and I don't feel like they are in here long enough to really see what's going on. I don't think that maybe its being explained to the teachers that that's their goal for being here.

Every once in a while you can sense the teachers who care ... but for the most part I get the opposite. That's probably about 20% of the time I feel the teachers genuinely care and they're there, and the rest I just really don't get that feeling from them. I mean a lot of times it's probably hard for the teachers too because the kids love it here and is probably can be personal for the teachers that the kids are like “I love being here.” I think some of the teachers are just burned out from their jobs in general.

They already come in here with the predetermined attitude, “I don’t wanna be here, I don’t have time for this, I don’t have time.” So that is taking away from what they could be benefiting from being here because they are so concerned with time.

You have these groups where you are like “these teachers really care” and you have a good vibe with the school and the kids are happy. It was last week when we did Marine Science and there were a lot of teachers who would talk. So you get teachers who will talk and then you get some who don’t acknowledge you at all and don’t even say hi. ... Yeah I have got that, just the ones we got last week, I got a sense that the teachers didn’t care.

There are three personalities I’ve seen so far. There’s one I really like, that’s the one who comes in, they check on their kids and they are really excited about what’s going on. They look over the schedule and they know what’s going on. Then there’re other personalities that are just here to take a vacation. Then there have been groups that have been real sour, and then there are groups that have been totally up for it. It makes our jobs a little easier, especially when they are around and they’re active, always checking on their kids.

I think next year we’re talking about making it voluntary for schools to come and I think that will make a difference. I think that people that want to come will come, people that don’t want to come don’t come, because people that don’t want to come won’t get much out of it.

Plans for Changes to Day Program in 2008-09

At the end of Year Two, according to the TWLC Program Director, Gyla Bell, only four schools in the Anaheim school district will be on year round schedule and by 2010 all schools will be on a traditional schedule. Given these changes, and in order to reach out to more districts, TWLC plans to do away with the fifteen-day (three-week) sessions of Forensic Science and to only implement one-week sessions in 2008-09.

Although the Program Director recognized that the three-week sessions are preferred by the staff—“Our staff and the teachers absolutely love it. And you know I love it to. You get to build a relationship with the kids”—she indicated that the Center will have to limit itself to the one-week sessions in order to expand the program and serve as many 5th grade class rooms in the Anaheim and Magnolia school districts as possible. As such, the Program Director projected the goal of serving 144 students in each one-week session (24 per classroom).

The Program Director explains how the Day Program schedule will change in response to staff feedback regarding their experiencing “burn-out” doing one-week Forensic Science modules back to back and how the staff are involved in efforts to continually improve the curriculum:

The teachers did not say anything, but I can tell they were pretty burned out teaching the same curriculum week after week. When we met this past spring to talk about next year, they really wanted to alternate months. So September will be Marine Science and October will be Forensic Science. Before, they were doing mostly Forensic Science. Every Monday they taught the same activities and every Tuesday they taught the same

activities, week after week the same. [Next year,] every other month is going to be Forensic followed by Marine Science. So instead of only having four Marine Science weeks, we're going to have a lot more. Staff needed a change.

—Interview, June 2008

TEACHER PROFESSIONAL DEVELOPMENT COMPONENT

The TWLC Teacher Development Component of the Day program was designed in accordance with the interests and needs of teachers as expressed in focus groups conducted in the Spring of 2008 with seven fifth grade teachers from the two local school districts that would be participating in the program: four teachers were from Anaheim City School District and three teachers from Magnolia School District. In addition a staff person from the Discovery Science Center who had been involved in the development of the COP Year One Forensic Science curriculum participated in the two days of planning in the spring of 2008. Teachers spent three days at the Center (May 15-16, and June 5, 2008); the first day they observed students engaged in the three-week Forensic Science module and the next day they engaged in a group “brainstorming” (Program Director Interview, May 2008). From those discussions with local teachers, the Teacher Staff Development Program was developed for teachers who were to accompany their students attending Day Program at the TWLC\ in year Two.

One of the TWLC Learning Facilitators who led the Physical Science Professional Development workshops spoke of the initial challenge and success she experienced in her new role leading activities with adults:

With the teachers, in the beginning it was quite difficult because I didn't know what their needs were. I feel them out in the beginning and I have had plenty of groups that walked in and did not know the difference between physical and chemical characteristics a solid, gas and liquid. That is a big California fifth grade standard. That is where I feel them out. Some people have really big science backgrounds and I don't want to step on their toes and the way they teach. So I do feel them out. Out of a group of six if I am getting into two heads that is big for me. ...I have had teachers who want to go way beyond what I have to teach. Because of my background with biology and in education I could go that far. I could go ahead and explain and explain and go even further and deeper. So yes, it is going really well. I'm enjoying it.

—February 2008

An overview of the content and structure of the teacher Professional Development Program is provided below, followed by reports on the teachers' experiences in workshops, their perceptions of the program benefits, and their suggestions for improvement.

Overview of Teacher Development workshops

The teachers who accompanied their fifth grade students during their one-week stay at the TWLC engaged in a series of staff development workshops about how to integrate an Assets development approach and hands-on physical science activities into their classroom practice.

Examples of science activities they were introduced to during a one week session include 1) Chemical Properties; 2) Matter and Chemical Reactions; 3) Metals; 4) Separating Substances; and 5) Chemical Reaction Demos. Teachers who returned a second week were also introduced to ways of integrating technology into their classrooms, including an Introduction to Digital Storytelling workshop. Teachers learned basic multimedia technology applications such as searching and saving pictures, recording audio and importing music, and using Movie Maker. Teachers also had the opportunity to create a multimedia project.

Teachers participating in the TWLC Professional Development program, like their students, were introduced to the Search Institute's 40 Developmental Assets and provided with an overview of Tiger Action Plan (formerly the Start Something curriculum) resources and follow up activities that are used in the TWLC classes. For example, during an observation of a training session, teachers were introduced to the free character education materials available on-line at the Tiger Woods Foundation website. Teachers spoke enthusiastically about the prospect of ordering their kits that same day on the computers at the Center. Teachers were given a copy of the *Start Something* book that students read in their TWLC class and told that they would get a classroom set to take with them. Teachers were encouraged to browse through the books and read a passage that jumps out. One teacher read, "Notice the kid everyone ignores." Another read "Respect others' opinions even if they are 100% wrong."

Teachers shared in focus group interviews how they were able to immediately engage their students' by using the *Start Something* classroom set of books as a starting point for dialogue and to begin integrating an Assets approach in their classrooms. A teacher shared the reaction of her students when handed out the Start Something books in her class: "The kids were wanting to tell me all about it. They wanted to take it home and we were on page 50 before we left" (November 2007). Another teacher commented:

[It provides] different scenarios and different situations that come up as adolescents and gives you ways to solve those problems. But it's not condescending and it's written in a way that they can understand it. It's concise and not preachy. The language and the tone are appropriate for them. It's genuine and heartfelt. They talk about personal experiences also. They talk about how Tiger Woods is bi-racial and we talk about what bi-racial is. I mean, [from] the way it's worded and scripted stem different kinds of conversations.

—November 2007

The Learning Facilitator also lead an activity with teachers to get them to think about how they can work to develop leadership in their students by assessing their attitudes, identifying leadership traits, exploring their own unique goals and leadership potential, and helping students learn about the importance of setting goals. Teachers were asked to set goals for themselves regarding how they would work towards addressing these aspects of leadership development in their classrooms in the next 6 months, identifying one action step, however small, that they could take in the next seven days toward that goal. In this way teachers were encouraged to begin practicing a developmental approach immediately upon returning to their schools.

In the focus group interview, teachers confirmed that they ordered the Tiger's Action Plan curriculum. One of the teachers in the group stated, "I can't wait to use them." A teacher

participating in a different focus group remarked on the value of exposing youth to a community service mindset through the Tiger's Action Plan curriculum:

I'm all for people giving back what they've received. That's what I really liked about that program. Whether we can implement it or not is questionable. I think too many kids are into the material things and don't realize there are so many people who don't have even the basics. I just really like the fact it opens up kids' eyes to helping out other people in the world.

–April 2008

A teacher reported that she took her class into the computer lab and had them go online to take the career test on the Tiger Woods Foundation website. “The kids loved that, I took it myself.” (November 2007)

A teacher from another group expressed a high level of enthusiasm for the Action Plan curriculum:

That was amazing. I think just to know that it's there. We actually went online right after the class and ordered our sets for our classes. We're probably going to do it at the end of the day as a closing activity, but we need something like this. We need more character development.

–April 2008

She preferred the Tiger Woods curriculum over the character development curriculum that the district offers and explained why:

The kids have more of a connection. After coming here they have more of a connection to Tiger Woods. They'll relate more to this because they have this experience. And I think it's just more kid-friendly.

–April 2008

She and her colleagues liked the flexibility it offered. As another teacher noted, “You can do whatever you want. You can read a little quote and have a five-minute discussion on it. Or you do a role-playing activity.”

On the other hand, teachers from a different school commented on the limitations they perceived in applying the Tiger Action Plan curriculum activities: “I would love to do that, but at this point I think it's going to have to be after school. I can't see any other way to fit it in.” A teacher pointed out that the school already has adopted a state approved character education curriculum that is research based. In this regard, she remarked, “I totally agree that the Tiger Action Plan is probably fabulous. I'm just having issues with it not being state approved or research based.”

Teachers interviewed also identified the 40 Developmental Assets as one of the most positive aspects of their TWLC professional development experience in that it was very much in alignment with instructional goals of their school and district. As one teacher indicated:

Specifically, [I appreciate the overview off] the 40 developmental Assets. Our school's focusing on engagement and getting students engaged. Once they are engaged, we can

then learn to do almost anything. We are really looking through those eyes and trying to get student-teacher relationship a little bit stronger than it is right now.

—November 2007

A teacher from a different school also recognized the value of introducing the Assets Approach as part of the TWLC professional development program in that it helps advance the school districts' goals:

I'm very excited to finally see teachers trained in Asset building. I've been involved with it for the last seven years, and have been trying to get it going in Anaheim City School District, and have not had any success, so to hear that it is being promoted here, and that all fifth grade teachers are being trained is like a dream come true. [...] Clay Roberts [of the Search Institute] came and spoke with our administrators. And then, even though people have talked to administrators about it, until they actually were exposed to it... now they're coming back to their schools and talking to other teachers. So to have all fifth grade teachers trained district wide, I think it's fabulous. It's about time.

—November 2007

A teacher from a third school acknowledged that she was first introduced to the 40 Developmental Assets in the training at TWLC and how it has affected her outlook and potentially her practice:

I hadn't heard of it before. It was definitely interesting to see, and it kind of made you look at things a little differently. It's something that I'm looking forward to trying to incorporate in my class, so students are aware of these important assets that they can have or can develop.

—April 2008

Her colleague discussed how she plans to integrate the Assets “during teachable moments,” when students bring up different issues during class, to help “kind of see it a different way.” Still she recognized how the entire school would benefit from a more integrated approach:

But we'd like to make it a whole school thing, but we definitely need to get our principal on board which wouldn't be a big deal. We're just wondering how we could make our whole school on board because it seems like it would transform the entire atmosphere with the teachers with the kids. We're still talking about how we're going to get hundred percent by, so that way we can be as effective as possible. ...We'll use it for sure. But possibly having our entire staff train on it, and to go through that and actually make some action steps for our school would be very beneficial. We've made action steps for our classrooms, and that's exciting, but we'd like to see a school-wide thing.

—April 2008

Teachers in one focus group considered that their colleagues are already overwhelmed with so many trainings, mostly focused on “making teaching more rigorous”, and that to add an Assets training would be considered as “just one more training.” Instead, they advocated for an approach that was less intrusive where teachers who come to the TWLC share their Assets experience with their peers back at the school site. One teacher proposed, “and then we do it for

our staff and they're like we want to know more, then we could contact Tiger Woods, 'We need help, we need somebody to come and share more,'" indicating the perception of the TWLC as a professional resource for teachers and the school.

In addition, 45 minutes were blocked out in the daily schedule for teachers to observe their students engaged in the learning activities of the TWLC Marine Science or Forensic Science Modules as well as Asset Development activities and Career Exploration activities. A grade level planning time (12:30-1:00 pm) was also scheduled for teachers to meet and plan their lessons. In the afternoons (from 1:00pm-2:00pm) teachers were free to participate in an enrichment class with their students.

A TWLC professional development instructor observed how the teachers used their time outside the workshops provided:

[A TWLC staff] does an asset walk through [with the teachers]. She has them walk around with a clipboard and a couple of questions. They walk around and do that and [the TWLC staff] talks to them after. I only give them about thirty minutes a day to run up and see what their students are doing. I also give them grade level planning time. During enrichment while I'm teaching. Half of them sometimes stay in a room while they continue their grade level planning, correcting papers, or the others walk from classroom to classroom to see what their students are doing.

—February 2008

The following vignette portrays a physical science workshop for teachers led by a TWLC learning facilitator who has a science background.

PROFESSIONAL DEVELOPMENT SCIENCE ACTIVITY

Seven teachers from two local elementary schools are in the Computer Clubhouse, on the lower level of the Tiger Woods Learning Center where the TWLC professional development activities usually take place, while their fifth grade students enjoy their own science activities in classrooms upstairs. The teachers range in age from their mid-twenties to forties. They sit around a long worktable in the center of the room ready to begin their second science activity workshop of the week. The TWLC Learning Facilitator (LF) stands at one end of the table and in front of the whiteboard where she writes as she presents the science content that serves as background knowledge for the activity they are about to do together.

The LF models how to teach students photosynthesis through a hands-on activity. The teachers listen attentively and take notes as the LF writes key science concepts on the whiteboard: xylem, chloroplast, chlorophyll and stomata. She draws a tree trunk and leaves in green and the word "photosynthesizing" next to the tree and asks the teachers, "What does it make?" A teacher answers, "glucose." The LF then draws in red the oxygen coming out of the leaves to illustrate the concept. One of the teachers mentions that "stomata" (the microscopic pores found on the under side of leaves) is a fifth grade vocabulary word.

The LF explains how you can create a game where students model the process of photosynthesis (the process of oxygen production as plants process carbon dioxide). She explains how the activity teaches the concepts, "through movement and use of cards that identify students as stomata or chloroplast." She continues to encourage the teachers to think about the science concepts behind the activity they are about

to do: “What happens to the glucose in the tree, does it go back into the soil?” she asks. A teacher responds, “It is used by the cells.” The LF continues to explain, “In the winter it stays alive through glucose stored in the trunk.” She writes the formula for photosynthesis on the board. One of the teachers shares how they had this question on the state exam and her students were stressed that they did not know how to answer it. Teachers converse briefly about how frustrating it is when content appears on a standardized test that they have not yet covered in class, making the students feel unprepared.

The LF reminds them that when talking about molecules you can never change the subscript (used to indicate the relative numbers of atoms of each type of compound). She demonstrates how to represent chemical compositions of two molecules of water. The LF further explains that as they do this activity they will understand why the formula is written as it is, “It’s just like any math problem.” She writes the formula on the whiteboard. As the teachers discuss the activity and ask questions, one teacher is pleased that she has learned a key point: “I remember teaching them the formula and I thought that was enough...but [now I know] if I teach them the subscript then they know [how to answer the question]. I understand what you are talking about.”

“Okay you are ready to do our [science] activity,” the LF announces and explains that they will be making a 3-D model of a glucose molecule. She assures them, “After you do the activity with your kids, they will understand.” The LF places a good quantity of small pink and white colored marshmallows and toothpicks on the table for the teachers to create a model glucose molecule.

The LF guides the teachers through each step of the activity, continually asking questions to check for understanding. She passes out a set of cards that explain the activity, remarking, “These are really good for your visual learners.”

The LF continues to explain to them that putting together different elements produces a chemical reaction and then explains how to make the oxygen molecule, “double bonded with another white.” Teachers get chatty as they construct their molecules. The LF reminds them that they need to finish before their lunchtime. The teachers quickly focus on their molecule building and are relaxed and engaged. An older teacher comments on the stickiness of materials; the LF gives them a tip to add baking powder. A teacher remarks, “All this stuff just to make one glucose!” One asks jokingly, “Can we eat our mistakes?” Two teachers negotiate which is the right combination of marshmallows to make a molecule. By doing the activity they experience the learning process of their students; their comments show how they recognize the relevance of this activity to the science they teach in their fifth grade classes. They all complete their molecule models in the allotted time and the LF announces, “We are done.” The teachers express their appreciation, “thank you very much!”

Focus Group Interviews: Teachers’ Perceptions of Students’ Experiences at the Center

Four focus group interviews were conducted with teachers participating in the TWLC Professional Development workshops. Interviews took place at the end of a one-week session. Two of the interviews were with a cohort of teachers whose students participated in the two week Forensic Science Module; hence they had two weeks of professional development activities at TWLC, one week in

For me it's been exciting seeing my kids excited about learning, seeing them interact with the fish [dissection activity].

—5th Grade Teacher

November 2007 and a second week in May 2008. Only one school that had participated in the first week was able to attend the second week. Therefore teachers from a third school participated in the follow-up focus group interview in May along with the teachers from the returning school that had participated in the first interview. Still all teachers in that interview had come to the TWLC a previous week. Two other focus group interviews were carried out with teachers participating in a one-week Marine Science Module. The teachers from each school that attended during the same week in April 2008 were interviewed separately. A total of 15 individual teachers participated in one or more focus group interviews. (See Appendix B.3 for Professional Development Focus Group and Follow-up Teacher Interview questions).

Teachers in focus groups shared many positive aspects of their experience at the TWLC as well as their impressions of their students' experiences. Teachers stated that they enjoyed observing their students at the center engaged in science activities using technology, such as laptops, and being excited about learning. Teachers' positive perceptions of their students' response to the TWLC are reflected in the following statements:

I've heard nothing but great things [from my students]. They really enjoy coming here. Kids are having a great time. There's a lot more confidence in the use of technology here. They're going to go back and teach us moviemaking.

—April 2008

I think they also get a connection with the Center, and the activities that are on goal setting, all of that that the center does.

—April 2008

The kids have been very impressed with their instructors, about their personalities, their methods. They're enthusiastic. I've heard nothing but really positive remarks about their instructors, that they really like them.

—April 2008

As a result of seeing their students in a different educational context outside their normal school setting, teachers conveyed how they were able to reflect on their own practice and were motivated to think about changing the learning environment in their classrooms. As one teacher noted:

I've seen students write things who do not participate in class. I've seen students participate who normally don't say much but now I have them hooked. I know what they like. It seems to me that there's a really good balance [in the TWLC science classes]. It's only a little bit of note taking; it's not a lot. Here are a few notes, here's an activity. You have to have a background of what it is. You have to know at least a little about it to do it. And you get to do it right there. So there's an incentive to do those notes and learn that information because now you get to do something with it.

—November 2007

This same teacher, as a result of these observations of her students at the Center, planned to allow her students more time to process content through dialogue with their peers to increase their understanding across the curriculum. She continued:

I think I need to give my kids more discussion times to talk to somebody else. Like I have them take notes, solve problems, then check with each other. I definitely think that they need to have more time to talk together. There's that uncomfortable cognitive dissonance, where they don't get it but that's how you learn it. So, you give information and you step back and kind of watch them squirm a little bit, but then that's how they learn, not just the science, but I think other subjects as well.

Another teacher explained how seeing the level of engagement of her students at the Center, with the benefit of the technology resources that enhance their learning experience, motivated her to want to return to her classroom and do the hands on science activities provided by TWLC for use at their school sites:

I like to also see my kids learning and seeing them use all the technology, all the science equipment, because they don't get that. We don't have that available. It makes me more excited to go back, and more excited to get into things, and to use the tubs and put into place what we've learned. Just seeing how the kids want this so bad.

—April 2008

Another teacher gave a general positive review of the program, highlighting the academic focus and science content imbedded in the TWLC activities she observed her students doing:

I think it's great. They have to know the academic language. They are using the academic language, which is huge. As far as relating to the California standards...the biggest chunk of standards is investigation and experimentation. I think they are definitely using all the standards, note-taking strategies and all that stuff.

—April 2008

Teachers returning for a second week in May (2008) had this to say about their students experience at the Center:

The kids are thinking beyond high school. They are thinking college, and careers. They are thinking about their future, and the consequences of their actions. They are relating what they do now to the future, whereas before they didn't care. [The TWLC starts them thinking by] talking to kids about what they want to do when they grow up. They talk about careers they never even knew existed and how science is very cool. It's something that they didn't know they used every day. The way that it was presented to them here maybe showed them that it is used in everyday life.

I think everything from the way things are presented. I mean the kids come back and talk about smart boards and how I need smart boards. Everything about the way the building is designed to look like a college campus and feel like a college campus and they have all these great tools. Everything from that to being given more autonomy in the classroom like being handed the laptop and being told to go forward in a movie, and maybe not being as controlling as I might be. Just the way teachers are with them is very empowering, and the expectations are very high. They are all expected to be able to do certain things, and they do and they feel like "oh, this is what college is going to be like." It's very empowering. They are given a higher level of expectations. Experimenting with DNA and extracting DNA from a strawberry are things we could never do in our classroom. We are limited by standards and tests. It gives them a week away to actually just explore things that are very valuable to them like life lessons.

Focus Group Interviews: Teachers' Perceptions Professional Development Experience

Teachers in all four focus group interviews generally rated their experience at the TWLC positively. Many of the teachers interviewed acknowledged that they had known little about the Center and were glad to become more aware of the facility and all the program offerings as presented to them in the first day of their professional development workshops.

I think that finding out about Tiger Woods Learning Center was huge because to me. I wasn't aware that there was an afterschool program that kids can come to 7th grade on, the scholarships that they have. We teach right down the street, and I had no idea that these kids had such a tool at their fingertips.

—April 2008

Some teachers communicated that they enjoyed the pace and the structure of the Professional Development workshops and time they spent at the TWLC. As a one teacher stated, “I like the flexibility of the schedule. It wasn’t a grind. It wasn’t all day long working here and it wasn’t overwhelming.” The workshops were interactive which allowed teachers to dialogue, learn from each other and to be active in their own professional development process. This view is reflected in the following teacher comment:

The pacing was not overwhelming. I like that we were able to have conversations. It wasn't like, OK we are going to sit here and learn and take notes. We had our own stories that we were able to relate back to our own classrooms. If you are constantly talking about this then you have something to say, then it keeps you involved and active. The pacing with the schedule was great, and there was flexibility with the instructor as well.

—April 2008

Teachers also appreciated the time they were given to plan for their return back to the regular classroom. As one teacher commented:

This has been a fantastic week. Normally, I come out of professional development and I feel like it was a waste of a time. This is manageable and I didn't feel like I was wasting my time. I loved it. Also by putting the planning in, I'm not stressed walking in on Monday. Because usually, you are gone for a week, and it's very stressful, because you are away from your site and you still have to be ready on Monday.

—April 2008

Teachers in the focus groups shared how their TWLC professional development experience has influenced their view on science teaching and their own classroom approach. A participant of the two-week program stated emphatically during the first focus group interview in the fall that her time at TWLC has “absolutely” changed the way she will approach not only her science instruction, as well as other subjects. She explained how:

Just applying it to real life and turning it into an actual career that they can have. Not making it seem like science is separate from rest of your life, and shows how you can apply science in your daily life. I've always done hand-on activities and that's the part that they love the best. But I think specific career applications have been useful. So

when I'm doing things, I'll be more like, 'you are a chemist and that's what you would be doing'. I think I'll be more apt to look through the eyes of a scientist. We can use it not just in science, but math, language arts, and everything.

—November 2007

A teacher further commented on how the TWLC experience helped her to think about how to make science more relevant to her students by contextualizing it in real world applications:

I think giving them a big picture and seeing where things fit and giving them abilities to problem solve. So they can [see that science] is not contained in the four walls of the classroom, I can think like this wherever I am...I think a lot of them get stuck with the thought that science is so boring.

—November 2007

Another teacher commented on the usefulness of doing the hands-on physical science workshops that were part of their professional development experience:

I really liked the hands on activities that were we were all able to participate in. [We got] to see what we can be teaching. I liked that each activity was demonstrated to us. Sometimes you have to go get a book, find them, and you have to read how to do it, but once you've seen it it's really easy to just do it.

—April 2008

Teachers in the one-week session focus groups related how their exposure to hands-on science activities will help them enhance their science instruction. An experienced teacher shared that she taught the “matter unit” in her class already “so some of it was repetitive for me.” Still she stated, “I got a couple of new ideas.” She further explained how a particular activity supported her effort to better prepare her students for testing:

I really liked the metals [activity], which kind of combined the metals, which is the elements, with the electricity, which is fourth grade [science]. Our biggest problem is that we have to teach fifth grade, but we're tested on fourth and fifth grade science, so we have to find some way to remind the kids of what they learned a year and a half ago. I like the fact that [this particular activity] combined that.

—April 2008

Another experienced teacher echoed this feedback and further commented on what she liked about the science activities presented in the workshops:

For me, I've been teaching for ten years, but I'm a first year [teacher of] grades four/five, so seeing that metals related to electricity, that just gave me an idea of that's the way I can pull fourth and fifth grade together. But also, again being a first year four/five teacher—I come from a primary background, so I'm used to using manipulatives—I really appreciated the marshmallows and toothpicks, making the molecules, because this is something that the kids will have fun doing, and it's hands-on. And, I would like more of the hands-on activities, but those were very helpful.

—April 2008

Teachers' Response to the Activity Kits

With regard to the usefulness of the Physical Science Activity kits that were made available to them, teachers talked about how they liked that they could access all the materials they needed to do the activities in their classroom. One teacher commented, “*I like the fact that we got to check the materials out so we can take it home and practice with it at home.*” However, in the one-week focus groups, some teachers expressed concerns about not having received sufficient orientation to the kits while at the Center.

Offering feedback on how to improve their professional development experience, teachers voiced a desire for less content delivery as they felt they already were “versed in the science standards.” As one teacher put it, “I guess [we prefer] kind of being taught as teachers not as students.” In addition, they stated that they would have liked more time reviewing the science kits available to them to check out and use in their classrooms. A teacher explained who the TWLC workshop experience could better address their needs:

I really appreciate the kits that are available to us. I would have liked more exposure to actually going through the kits and how to do the kits, and maybe a little less on the content. And more on these activities, more examples of activities we can do using the kits; or just basic activities using the kits. I would have liked to have a kit out in front of me shown us so we could go through the kits versus lecture on the content, which we already teach. And in the time given, I think it would have been more valuable to spend more time on the kits, if we are going to be using those kits. Because I don't even think we actually really saw a kit. She pulled out one of the kits, but it would have been nice to have it on the table and to go through it. Because honestly the kits that were provided at school, I think these will be great to supplement, to use along with them. But now I feel like I've got to go back to school, order a kit, and spend time going through it to figure out what to do versus I would have liked to do that here.

—April 2008

A teacher in another group provided similar feedback, emphasizing her preference that the workshops include less content delivery and more time for teachers to discuss and share strategies for doing the activities in the classroom. She suggested the following:

Do the activity maybe, instead of [lecturing] and taking notes. Actually, after the activity talk about what you would do differently in your classroom, or take it to the next level to application because it's like we have the notes, and we have the packet which is awesome. I love it. I'm not putting that down. I definitely appreciate it. I would rather not write notes down because we have the information in our science manuals anyway, we know the information. [Instead] do the experiment just to see how it runs, and then talk about the practical application. Actually we talked a little bit, but we didn't have a lot of time. Some teachers actual gave some pointers of what they've done, and that was very beneficial.

—April 2008

In May 2008 teachers participating in the second week were asked if they had an implemented any of the activities introduced in the previous session or if they had checked out any of the kits.

Teachers reported that they had either checked out the kits or had done activities learned in the workshops with their students.

We did the balloon experiment, trying to separate mixtures. We did periodic tables...compounds. It was fun. We did about four different activities.

—May 2008

Another teacher stated that she did not check out the kits, but instead got the materials she needed to do the activities herself: “It was just easier for me to pull it together.” She explained that she did the periodic table and marshmallow activity creating a molecule model and reported that they were a success and that the activities addressed science content that helped her students understand key concepts that would help them perform well on tests.

It went really well. We did it once as a whole class, but then I wanted them to be able to glue it together ...to create the glucose and the oxygen...We did it once the actual way—building everything—and the kids loved it. I was quizzing them, and they seemed to have gotten the concepts...They loved it. It's going to be good for testing. They have testing next week. They get the table, and now they understand how it works.

—May 2008

Teachers recognized the relevance of the activities they learned at the TWLC to the science they teach in their classes. A TWLC staff who led the workshops shared that she received feedback from teachers and students who return for a second week indicating that, even though they did not always check out the science activity kits, they were able to apply ideas from the workshops to their classroom:

There are two things that I do when they come back for week two. I do speak to them and see how things are going and what activities they have done. Even though they are not always checking out the bins, they are actually doing tidbits from my lessons from when I am with them. I even ask the students of theirs when they come back [to TWLC], I ask them “how is the science section going?” We go around the classroom and they give me anything that they have done. There are things that they’ve done in their classrooms that I’ve taught [their teachers] downstairs.

—February 2008

Teachers also planned to apply the technology integration ideas learned in workshops during their second week at the TWLC. A teacher explained that although she had been using PowerPoint and the Internet in her classroom on a regular basis that what was new to her and her peers was learning how to use Movie Maker, “I never knew what it was. It kind of demystified it for me. It’s not that hard.” As a result of this one-week experience learning how to use multimedia, another teacher in the group commented, “I think I can apply it to anything we are studying”. She elaborated:

I have all my Social Studies materials here, and I plan to have a Social Studies project for my kids. I think now they are going to learn [...] the way to present what they have learned [in Social Studies] through multimedia. You can use Social Studies; you can use any area, and integrate a lot of different things. The students were definitely able to understand the story structure, and integrate a lot of different skills. They are showing

a story. You can definitely see their thought process even though they are not writing. ...I think you can use it for absolutely everything. Even as teachers, we had one person that did a grammar movie; another person did a math movie; and one person that did a “building knowledge” movie. I think I can apply it to anything we are studying.

—May 2008

Although teachers confirmed their intention to continually incorporate more multimedia, some teachers expressed concern for the challenges that emerge when allowing students more independence when working on such projects and the limited access to the technology resources at their school site. As one teacher pointed out:

The biggest problem is the lack of computers. Actually for our school it is not the lack of computers but the lack of not being able to get in [the computer lab]. But, then again, looking at what [the TWLC instructor] did with the kids in five days, we actually accomplished [a lot]. ...The class tends to get a little noisy. It's not like I have a problem with that but some students can really escalate. I think the benefit outweighs the challenges. But there are challenges.

—May 2008

Time was identified by teachers as one of the main challenges to enhancing curriculum and instruction with technology—in addition to access to resources—considering all of their professional obligations during and outside of the instructional period. These concerns are reflected in the following teacher’s statement:

It just feels like we, as teachers, have a hard time to be really creative and be different. I would feel guilty to be different. ...I am still making sure that my kids know their multiplication facts. I am spending time on that as opposed to being creative. Even though this is what gets them excited about learning we can maybe teach them multiplication facts through this. If we were given time, money, and resources to get them excited, I think that would be efficient, and if we had more time to boot. I mean even our videos, as great as they were, took us two hours outside of our teaching time to do. We don't get two hours a week to do this constantly. And the time we already spent outside of our workday is on correcting papers, planning lesson plans. So to add another two hours to our week to get a one to two minute video...While I love that, I do not have two hours to do that. ...It would be really hard for me to justify doing that. After the test is over, maybe then we can do stuff like this. We have a lot of pressure from the state. There are just so many things we have to do. We have to do demos. We have to do all these other things constantly.

—May 2008

This teachers’ statement reflects a generalized view that the technology enhanced learning at the Center was not feasible for them to fully carry out at their school sites. Although they appreciated the offer for a TWLC staff to provide them with follow-up activities at the school site, the logistics of time and access remained a concern:

[The TWLC staff] mentioned how she could come out to our school site and teach the class in the computer lab and do a Movie Maker thing with them. I think all of us are excited about that. The idea of having someone that the kids already respect and, other than that she's from Tiger Woods, to come out and help teach, that would be great. I

would love that, but we have half an hour, once a week in the computer lab. How much [can we do], by the time we get there, turn the computer on... I have half an hour and that's it. ...But that was really great that she offered to come out and teach our students at our school site, which was really, really nice; but now we have to try to figure out how we can do it.

—May 2008

In summary, teachers who experienced the second week of professional development workshops confirmed that they saw value in allowing students to express their learning through technology enhanced media and voiced a willingness to try and integrate this approach into their own instruction. However, teachers were also quick to point out the time constraints and institutional (district and state expectations) and material conditions (access to computers and time) that make it difficult, from their perspective, to carry out the technology integration and hands-on approach they are exposed to at the TWLC. In the words of one teacher, “Honestly, I think it is an impossibility until we get more funds and fall away from those standards.”

Suggestions for Improving Professional Development Component and Student Day Program

Although teachers appreciated the overview of the TWLC curriculum and programs, several expressed that they would like to have a more in depth understanding of what their students were doing while at the Center. A teacher suggested that they be introduced to the same science activities that students are doing in their science modules “upstairs”. She elaborated:

They are definitely sharing their experiences with us. We get to see their journal but without knowing the program. I would love to run it with them. I want to be a student. ...Have some students teach us how to do it. Have kids show us what they have learned, it would be so empowering for them...I'm amazed by what they are telling us but show me. That would be awesome to do a demonstration. They would love that. That can be an incentive. It wouldn't have to be like during the whole class time but it can be just for a little bit.

—April 2008

Another teacher added that she would have liked to have been exposed to all the enrichment activities in order to understand better what her students were doing and to better extend that learning into her classroom.

A number of us have been to sixth grade camp. At sixth grade camp, the first day what they do is they take you on all the walks that the kids are going to go on to train you. We were kind of assuming that the first day [at the TWLC] they would show us the robotics, show us the engineering, and show us the performing arts. We kind of expected to be trained in that, so when we go back to the school, we can go ahead and say, hey, when she made you do that thing ... what was your response? And so really the first day for me was kind of a wash.

—April 2008

Her colleague added along the same lines:

Our students are bringing back projects that they've done here and I have no idea how to assess them or what to know is complete, what to know was a good project, because I don't know what the expectations were. And I don't know what they were asked to do, so I don't know if they even did them correctly.

—April 2008

A teacher in this same group agreed with her colleagues and pointed out: “Our experiences and the kids' experiences are totally not parallel at all.” In general this group shared the sentiment of not being connected to what their students were learning, which seemed to produce some uneasiness on their part.

These teachers further expressed anxiety about time not being well spent given the pressures they experience in the current school climate of accountability. One teacher pointed out that Marine Science is not a fifth grade standard and further commented:

A whole week is a lot to ask, and at one point I went into one classroom, and they were done with their enrichment project, and they were asked to work on their laptops on engineering videos. Well, one of the engineering videos was a virtual pinball. You know what, with No Child Left Behind, we don't like to waste even a minute!

—April 2008

Her colleague voiced a similar concern:

I was a little concerned when I asked a student what had happened during the day, and they were very excited about having watched a video that took an entire hour. We would never think to show beginning to end, a 60-minute video in school. We just don't have the time, nor do we have the attention span.

—April 2008

Another teacher thought that the TWLC curriculum should be more oriented by what the students should be learning in school, arguing that the TWLC student program should be driven by the academic content standards in a much more explicit way:

I would have the kids do science units that are the units that we teach in fifth grade versus forensic and marine science, which are fabulous. I love them, but this is a huge, huge chunk of time, and they are tested, and there is a huge accountability. So why not teach them units that they're being held accountable for...Time better be really well used. Standards based. Fifth grade standards based. The standards have to guide their instruction.

—April 2008

A teacher from a different school echoed this position, proposing similarly that the TWLC program be more closely aligned with the science curriculum that they are required to teach at the 5th grade. The teacher suggested, “They could still do the same activities, but make it based on one of the units that we *do* study, or have already studied.” This idea was supported by her colleague who proposed that students' TWLC experience serve more as a set of extension activities that reinforce the content students are learning in school with out losing its hallmark enrichment and career focus:

Maybe even keep the afternoon the same. The afternoon is the career time, but in the morning when they're doing the marine biology...it's amazing, but we were noticing a lot of concepts that they were doing and spending a lot of time on that they are not tested on. They're not state standards. I guess we were talking a little bit about looking at the standards and having a unit based on weather and climate or the solar system even if they've already been taught that in our classrooms, [because] we barely have enough time for science. We feel a big frustration because our science time is always taken away. It's the first thing to go. We're just trying to follow the rules, do the right thing. Even if they've already learned it, they get all the hands-on technology. They can still use the technology for the standards. And then they [the TWLC staff] don't have to spend so much time teaching it because it's more of a re-teach, "You remember this, OK." It's more of a reinforcement.

—April 2008

In summary, teachers seemed to want to be more involved in the experiences their students were having at the center so that they could support and extend that learning beyond their stay. They also argued that students be exposed to science content more directly connected to 5th grade standards to support student test performance. As regards their professional development experience, the majority also advocated that the activities they are presented be more explicitly driven by the 5th grade state standards for which they are held accountable. They felt that their use of time was not always productive, which made them anxious due to the pressures of NCLB, and the prevalent notion that they have *no time to waste*. Finally, they requested more time for discussion of the science activities and review of the kits in order to share ideas on how to apply them to the classroom.

Proposed Changes to Professional Development Component in 2008-09

Teacher feedback has informed the way that the Professional Development program will be revised for the 2008-09 school year. The changes proposed seek to better address the instructional needs of teachers who, as indicated above, want the activities that they are trained on at the TWLC to be more directly aligned with the science curriculum that they are responsible for teaching. The Program Director describes the changes that will take place based on feedback from teachers who participated during the program's first year in 2007-08:

They would like science training on something they have taught in school. For example, they would want a weather unit so that they can use that to supplement [their classroom curriculum]. ...We are going to create a staff development on how to make a chapter in a textbook more hands-on. ...They are going to come, and they are going to all do a unit together. They're going to pick the unit. So we are going to look at the unit, and teach them how to fit it in and how to make the unit hands-on.

—June 2008

Also, in response to teachers' positive feedback on the technology workshops, the Professional Development program will continue to provide technology training for teachers with the intention of going beyond basic applications, like the use of PowerPoint, and to start training teachers on integrating new technologies such as podcasting and blogging into their instruction. Still, issues of access to the technology resources available at the school site need to be addressed.

The Program Director also plans next year to structure the grade level planning time to ensure teachers use it more productively, with the expectation that teachers from Anaheim and Magnolia school districts who participated in 2007-08 use that time to plan another science unit in addition to the one they will be doing with the TWLC workshop leader(s). In this way, by the end of their week at the TWLC, the Program Director pointed out, “They are going to have two hand-on units that they can take back that are totally aligned with their curriculum.” The Physical Science kits will be used for the new districts coming to the Center in 2008-09.

Another important enhancement to the TWLC and Anaheim school district partnership will be the appointment of a teacher on special assignment to work with schools in the district to fully imbed the 40 Developmental Assets, working in coordination with the TWLC professional development efforts. The Program Director explains how this partnership will work:

We are going to work with the teacher on special assignment. She is already training with all the supervisors to get them started. Next year, with the Developmental Assets, we are going to look at what they already do so it's not like it's something else they have to do. They're already doing it. We are just naming it or labeling it. We are becoming more intentional by looking at what they already teach.

—June 2008

There are also plans to reach out to other districts, with the requirement that the district pay for the transportation of students. For example, the TWLC has been approached by a school in Long Beach who expressed high interest in participating in the Day Program.

In addition, the Year Two Day Program Marine Science experience has served to enhance the Summer 2008 Program, with staff creating new activities to pilot during the summer session. According to the Program Director:

We are actually doing a Marine Science and Oceans Alive for the summer. [Staff] have actually come up with more activities that we are planning on doing later. So they are going to try some different activities and see how the kids are responding to them.

—June 2008

Challenges that remain are evidenced in the interview data that revealed tensions between the Learning Facilitators' apprehension about the Day Program becoming “too much like school” and the schoolteachers' call for a more standards aligned curriculum. The TWLC staff and administration should continue to adopt a flexible and creative approach, reflecting on their practice, listening to feedback from the students and adults who participate in the Day Program and Professional Development component, and making adjustments to the program content and design to better address the needs of participants without compromising the fundamental principles that characterize the TWLC program.

SECTION III – YOUTH OUTCOMES STUDY

CHAPTER 3

YOUTH OUTCOMES STUDY RESULTS

INTRODUCTION

This chapter reports pre- and post-survey data of fifth grade students who participated in a one-week Marine Science or a two-week Forensic Science module during Year Two of the TWLC Day Program. As measures of students' science interest and efficacy, the Day Program students were asked on both pre- and post-surveys to respond to nine items that addressed their attitudes about learning and achievement in science. In addition, the survey included seven items that captured students' future outlook regarding college and career goals and three items that related to students' prospects for returning to the TWLC in the future.

Students completed surveys at the beginning and end of each one-week of participation in the TWLC Day Program. (Students in two-week programs thus completed four surveys.) All pre- and post- surveys were delivered to the TWLC classrooms by UCI researcher, Dr. Valerie Hall, on each day that they were to be administered. The TWLC staff then administered the pre- and post-surveys to the students in their respective classrooms.

Surveys were administered to a total of 16 weeklong sessions. Eight sessions of students in the one-week Marine Science module were surveyed (8 different groups of students), and 8 sessions of students who participated the two-week Forensic Science module were surveyed, that is 4 different groups of students who came twice to the Center during two separate one-week sessions. Table 3.1 summarizes the TWLC 2007-08 program week and dates that surveys were administered.

Table 3.1: Schedule of Day Program Survey Administration

Two-week Program Program Week (Dates)	One-week Program Program Week (Dates)
1 (10/1 - 10/5) and 15 (3/3 - 3/7)	4 (10/22 - 10/27)
2 (10/8 - 10/12) and 14 (2/25 - 2/29)	5 (10/29 - 11-2)
3 (10/15 - 10/20) and 13 (2/4 - 2/8)	6 (11/5 - 11/9)
7 (11/12 - 11/16) and 10 (1/7 - 1/11)	8 (11/26 - 11/30)
	9 (12/3 - 12/7)
	11 (1/14 - 1/18)
	12 (1/28 - 2/1)
	16 (3/10 - 3/14)

Pre-surveys were administered to students by TWLC staff within the first two hours of the first day of the one-week program (Monday). TWLC staff explained the survey and assisted students

in completing the practice questions on the first page. Students then completed the “real” survey questions independently, unless the TWLC teacher perceived the need to read the questions aloud to the class (for classes with greater numbers of ELL students). TWLC staff administered post-surveys on the last day (Friday) of each one-week session of the program. A total of 1730 pre-surveys were collected and 1405 post-surveys of students who participated for at least one week. For those students participating in the two-week Forensic Science module, and who returned for the second week of the curriculum, 348 pre-surveys were collected and 178 post-surveys were collected. The decrease in number of post surveys is in part due to inconsistency in the administration of surveys by the TWLC staff (i.e. some forgot to administer the survey to their class). A total of 1923 students returned at least one survey (978 female, 945 male). Students who participated in the surveys came from 20 different schools and 75 different teachers or classes. A total of 1232 students filled out both pre- and post-surveys in either a one-week session or in the first week of a two-week session. Of students who returned for a second week, 117 completed both pre-post surveys.

PRE-POST SURVEY RESULTS

Survey items were rated on either 4-point scales or 5-point scales, depending on the instrument. There were nine items related to science interest and efficacy, which constituted the same measure used in surveys of After School Program participants reported in Volume I of this evaluation study.

Students responded to these nine items on the 4-point scale indicating how true (“not at all true”, “a little true”, “somewhat true”, “really true”) for them were statements such as “At school science is fun”, and “It is important to me to be good at science.” Seven items related to students’ future college and career aspirations were on the 5-point scale (“very low”, “low”, “about fifty-fifty”, “high”, “very high”), and were also adapted from measures used for After School Program participants. Students responded to “how true” statements such as “You will graduate from high school” and “You will go to college” were for them. Three items addressed students’ plans for returning to the TWLC, on the same 5-point scale. Specifically, these items asked students whether they plan to attend the Computer Clubhouse on Saturdays, or attend golf on Saturdays, and if they intend to participate in the After School Program in the future when they are eligible once they enter 7th grade.

Sample pre- and post-surveys can be found in Appendix B.1. The survey items and computations were based on previous studies, all of which reported high reliability for the measures. Reliability analyses were also run with this specific dataset, and Cronbach Alpha coefficients were all above .85.

An increase in science efficacy and future outlook for students attending one-week program is shown in paired t-tests, comparing pre and post scores.

Paired t-tests computed comparing pre- and post-survey scores of the 1232 students showed a significant increase in both science efficacy ($p < .01$) and future outlook ($p < .01$), for students

participating in Week One of either a one-week or two-week session. It is important to note that the statistical significance is achieved due to the large number of cases and that the actual amount of change is small; a calculation of Cohen’s d shows that the statistical power of the analyses is low. For Science Efficacy, $d = .18$, and for Future Outlook, $d = .14$. However, these are still positive outcomes, given the short duration of program participation (one week, or a total of less than 20 hours of science instruction).

Table 3.2: Week One Pre-Participation Scores, Post-Participation Scores, Change Scores

	Pre-Participation		Post-Participation		Change Scores	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Science Efficacy ¹	3.12	.53	3.22	.57	.10	.42
Future Outlook ²	4.48	.57	4.56	.56	.08	.46

¹ survey items were on a 4-point scale

² survey items were on a 5-point scale

Paired t-tests, comparing pre and post scores show a statistically significant increase between pre- and post-surveys in science efficacy during the second week of the two-week Forensic Science sessions ($p < .05$). There was no change in future outlook, but it should be noted that the scores are already fairly high, and the pre- scores for students in their second week of program participation start out higher than the post- scores for the first week. Table 3.3 shows the Pre-Participation Scores, Post-Participation Scores, and Change Scores for students attending Week Two of the two-week program.

Table 3.3: Week Two Pre-Participation Scores, Post-Participation Scores, Change Scores

	Pre-Participation		Post-Participation		Change Scores	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Science Efficacy ¹	3.04	.68	3.12	.69	.08	.40
Future Outlook ²	4.59	.44	4.60	.53	.01	.35

¹ survey items were on a 4-point scale

² survey items were on a 5-point scale

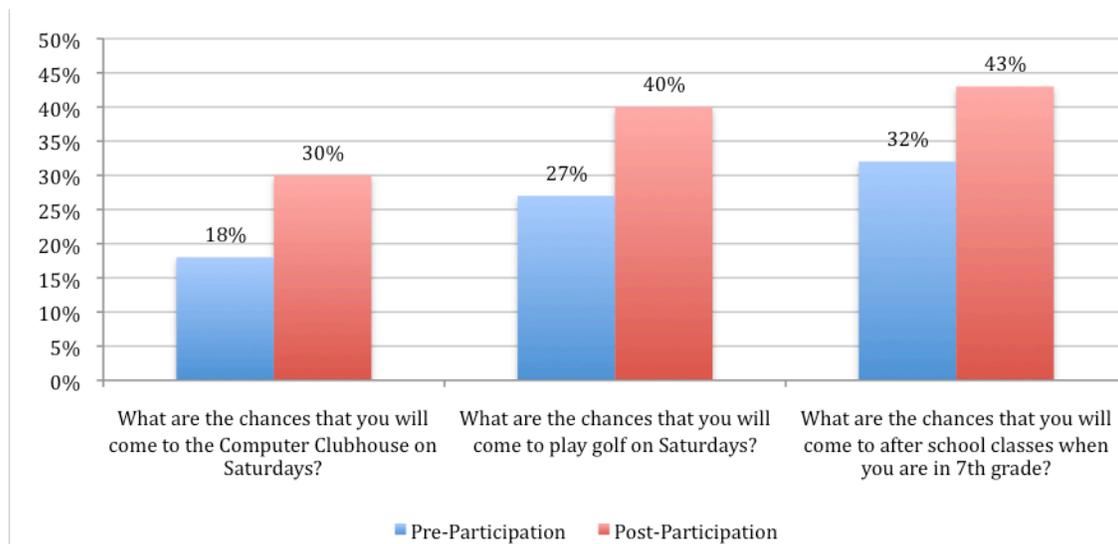
Comparison of pre- and post- surveys showed an increase in the number of students planning to return to the TWLC, on Saturdays or for the after school program.

Three items related to students’ plans to return to the TWLC to participate either in Saturday activities in the Computer Clubhouse or Golf clinics, or if they think they might return as a 7th grader and enroll in the After School Program. There was an increase in the percentage of students responding that the chances were “high” or “very high” for all three items comparing their response at the beginning of their one-week experience (pre-survey) with their responses at the end of the week (post-survey). Students responding that the chances for their returning to the TWLC on a Saturday to go to the Computer Clubhouse were “high” or “very high” rose from 18% to 30%. The percentage of students who stated that the probability was “high” or “very high” that they would come to play golf on Saturday increased from 27% to 40%. The

percentage of students who said that it is highly likely (that is they marked “high” or “very high”) that they will return to the TWLC as a 7th grade student and enroll in the After School Program increased by from 32% to 43%.

Figure 3.1 shows the percent differences between pre- and post-survey students responding that the chances were “high” or “very high” that they would come to the TWLC on Saturdays or for after school classes.

Figure 3.1: Percent of students responding that chances were “high” or “very high” that they would come to the TWLC on Saturdays or for after school classes



The student outcome data for Year Two students attending one-week and two-weeks at the TWLC indicate statistical significance in the change scores measuring students’ science efficacy and future outlook for those attending one-week, with only slight significance in change scores for science efficacy for students attending a second week, and no significant change in their future outlook. It is important to keep in mind that the pre-survey scores were already high for those students attending a second week, which can be expected since they had already experienced one week of TWLC programming. Also, more students in post-surveys, as compared to pre-surveys, expressed the intention of returning to the Center for Saturday activities or to enroll in the after school classes in the future after one week of Day Program participation. The survey data therefore indicates a generally positive influence of the TWLC Day Program experience on the fifth grade participants who attended in Year Two of the Day Program.

CHAPTER 4

TEACHER PROFESSIONAL DEVELOPMENT PROGRAM STUDY RESULTS

INTRODUCTION

The Tiger Woods Learning Center established the Teacher Professional Development program to serve teachers who attend the TWLC while their fifth grade students participate in either the one-week Marine Science module or a first and second week of the two-week Forensic Science module, in addition to other enrichment classes. The teachers were offered professional development workshops in physical science activities and assets development. For those teachers whose students participated in the two-week Forensic Science module, during their second weeklong visit to the Center they were offered workshops showing them how to integrate technology into their classroom instruction.

This chapter reports the results from survey data collected from teachers participating in the Professional Development Program from October 2007-March 2008. The pre-post surveys were designed to measure teacher's attitudes toward science instruction and their perceptions of the support they receive from their school in the delivery of quality hands-on science education as well as how they perceive the TWLC experience benefited their students and supported their professional development.

The week-one pre-participation survey consisted of 21 items on a 6-point scale (ranging from "strongly disagree" to "strongly agree"). To measure teacher efficacy about teaching science and efficacy about science content, teachers were asked to respond to items such as, "Science is an important subject for my students to learn," and "I enjoy teaching science;" or "In general I feel well prepared to teach hands-on science in my classroom." Regarding the amount of time spent teaching science and the level of support they receive from their school to do so, teachers responded to statements such as, "Teaching science is too stressful, or too disruptive," "I do not have support from my school/principal to teach hands on science," and "The principal at my school expects teachers to do hands-on science activities in the classroom."

Post-participation surveys administered at the end of Week One included 11 items also on a 6-point scale ("strongly disagree" to "strongly agree") to measure teachers' assessment of the effect of program participation on their students (did they like it, did they "get" it, was it worthwhile). In this section teachers indicated how much they agreed with statements such as "I think my students enjoyed doing these activities," or "The time spent on the activities would have been better spent on other non-science curriculum." They were asked to consider the notion of "building relationships" and how "practical or appropriate" it was for their classroom. They also indicated if they thought that their students would "look forward to returning to the TWLC."

An additional 19 items on a 6-point scale ("strongly disagree" to "strongly agree") measured teachers' plans to use the TWLC activities in their own classrooms, their assessment of how well or appropriate they think the activities would be for their students, and also their assessment of

the value of the professional development program. Teachers responded to items such as, “My students would have difficulty learning the science content behind these activities,” “The professional development program was not what I expected,” as well as more positive items such as, “I feel confident about implementing these activities in my classroom,” and “These activities were well-prepared and well-presented by the TWLC staff.”

Five open-ended questions included in the post-survey allowed teachers to provide written feedback about strengths and weaknesses of program, and suggestions for improvement of both the science enrichment program for students and the adult professional development programs. Pre-participation surveys of teachers returning for a second week included open-ended questions about whether or not they implemented the TWLC activities in the time since they were first at the Center during Week One and their return to the Center for the second week. If they did have the opportunity to carry out any of the physical science activities they learned in the Professional Development workshops or were able to check out the science kits provided by the Center for teachers use in their classrooms, they were asked how the activities went, and if they didn’t go well, why not. (See Appendix B.2 for sample Professional Development Pre-Participation Survey and Post Participation Survey).

The surveys were delivered by UCI researcher, Valerie Hall and administered by TWLC staff provided at the beginning and end of each session. The pre-surveys were administered during the first morning of the weeklong program. UCI researcher Dr. Hall gave a brief introduction to the teachers about the purpose of the study and communicated to them that participation in the study was completely voluntary both verbally and through the distribution of a study information sheet. Post-surveys were administered either before or after lunch on the last day of the same week. Envelopes were provided for each survey response. These were collected either at the end of the time allotted for survey completion or teachers were instructed that they could leave the sealed envelopes at the front desk, where they were picked up by UCI researchers.

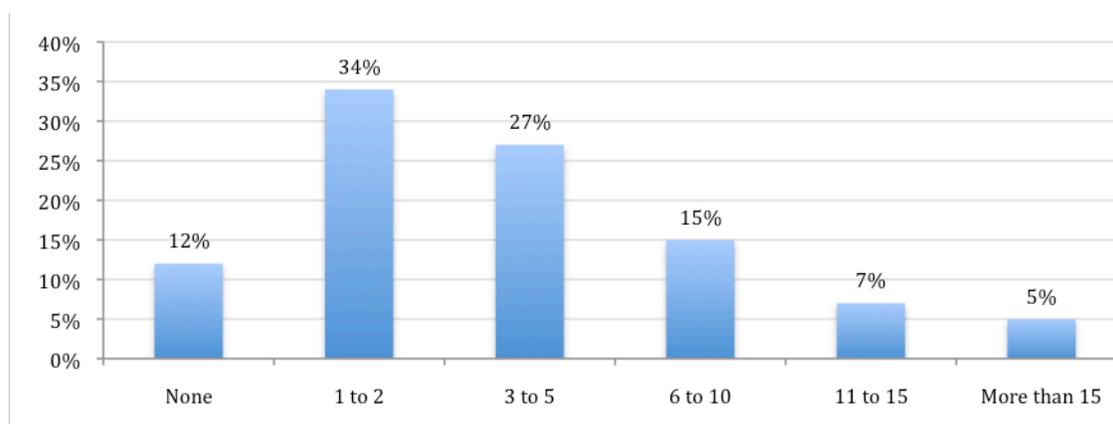
Teaching Background and Exposure to Professional Development Experiences with Science Focus

A total of 65 teachers completed at least one survey (53 female, 9 male, 3 declined to state). Descriptive data from the Week One pre-participation survey provided the following information about the teaching background and current teaching position of the survey sample. The mean number of years teaching full time was 9.52. The mean number of years teaching fifth grade was 5.34. And the mean number of students in their current class was nearly 30 (29.73).

In the pre-survey teachers were asked, “How many professional development events have you attended that focused on science? Twelve percent indicated that they had received no professional development with a focus on science, but 61% had received at least 1-2 trainings, 34% as many as 3-5 trainings, and the remaining 27% received 6 or more trainings related to science instruction. Given that the average number years teaching was at least five, it is not surprising then that the overwhelming majority had received at least some professional development in science and that nearly one third had participated in numerous science focused

training events during their teaching career. Figure 4.1 shows teachers' previous professional development experience with a focus on science.

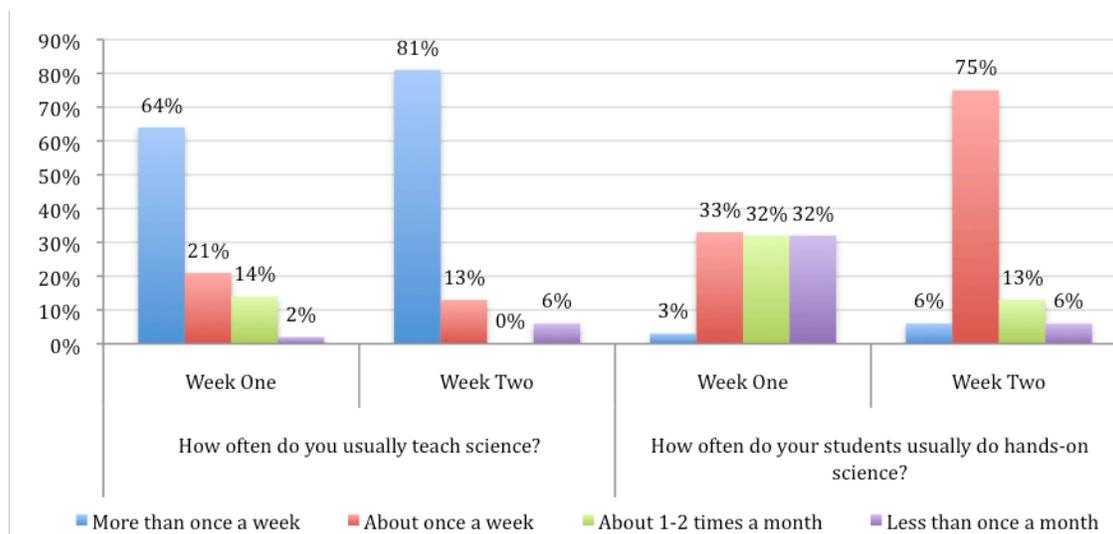
Figure 4.1: Number of professional development events attended that focused on science



Increase in the Amount of Science Teaching and use of Hands-on Learning in the Classroom

Teachers were asked in pre-participation surveys in Week One and Week Two questions related to the frequency of science instruction in their classroom, “How often do you usually teach science?” and the use of hands-on activities to teach science content in their classroom, “How often do your students usually do hands-on science?” Findings comparing teacher pre-survey responses in Week One and Week Two show an increase in the amount of science teaching that teachers report, with a 17% increase among those who do science “more than once a week” (growing from 64% to 81%). With regard to questions, “How often do your students usually do hands-on science?” there was a significant shift in responses that were evenly distributed across the categories of “about once a week” (33%), “about 1-2 times a month” (32%), and “less than once a month” (32%) in the Week One pre-survey, with 75% of teachers choosing “about once a week” when surveyed upon returning to the TWLC for a second week (a 42% increase for that response choice). These changes are illustrated in Figure 4.2 below.

Figure 4.2: Pre-Participation Scores, Week One and Week Two



Teachers' View of Science Instruction and Students' Science Learning Ability

Mean scores were computed for three areas: 1) teachers' sense of efficacy in teaching science, 2) teachers' view of the importance of teaching science, and 3) teachers' view of student's capabilities to learn science. These items were on the pre-participation surveys, so the "effect" was between the beginning of the first week, and the beginning of the second week, when they returned to the TWLC after having the opportunity to apply what they learned during the first week of TWLC professional development experience in their own classrooms.

The Teaching Efficacy measure consisted of six items, including statements such as, "I enjoy teaching science" and "I have a strong background in at least one area of science," to which teachers indicated their degree of agreement on a scale from 1 to 6 (4 = "Slightly agree", 5 = "Agree", 6 = "Strongly agree").

The Importance of Science measure also was made up of six items, including "Science is an important subject for my students to learn" and "There is generally not enough time in the school day to teach science," rated on the same 6 point scale.

The View of Students' Capabilities measure included four items with statements such as, "My students enjoy learning science" and "Most of my students have a hard time understanding scientific concepts".

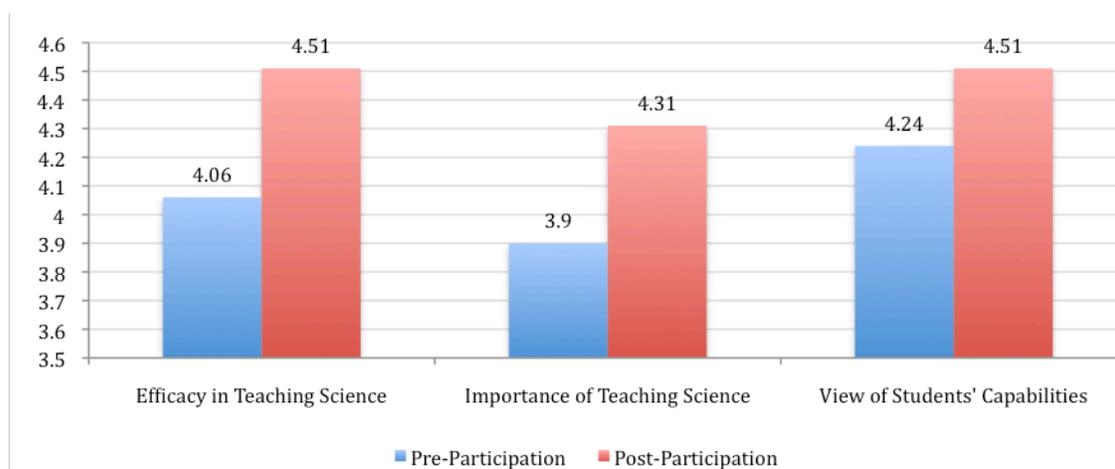
Table 4.1 and Figure 4.3 show the pre participation scores for Week One and Week Two on these three measures. The groupings of items for each variable were determined by factor analysis. All items used to compute the mean scores loaded above .40 on one of the three

factors. Reliability analyses revealed the following Cronbach Alpha coefficients: .86 for Teaching Efficacy; .79 for Importance of Science; and .74 for View of Students’ Capabilities. Note that the differences in scores were not statistically significant, but were positive.

Table 4.1: Pre-Participation Scores, Week One and Week Two

	Teaching Efficacy		Importance of Science		View of Students’ Capabilities	
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>
Week One (n=59)	4.06	1.03	3.90	.76	4.24	.84
Week Two (n=16)	4.51	.78	4.31	.72	4.51	.80

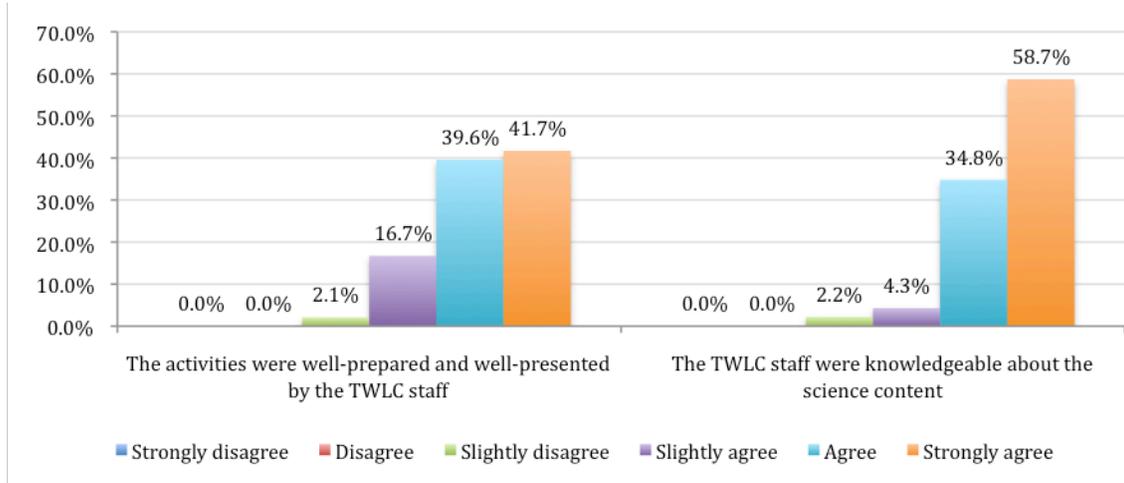
Figure 4.3: Pre-Participation Scores, Week One and Week Two



Teachers’ Perception of TWLC Professional Development Workshops

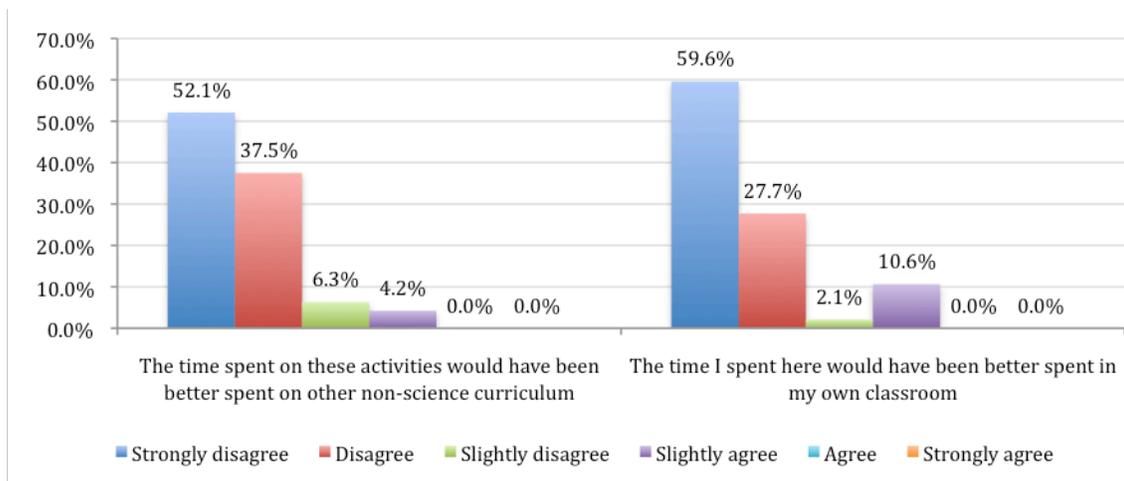
In the Week One post-participation survey teachers were asked to assess the TWLC professional development workshops with regard to how well the activities were organized and presented and the level of knowledge of the TWLC staff presenting them. TWLC instructors are young and uncredentialed, and generally inexperienced in “real” classrooms. Therefore these survey items address a critical issue, in light of the limited school classroom teaching experience of the TWLC instructors who lead the workshops and potential apprehensiveness of teachers about receiving instructional guidance from them. Teachers, however, overwhelmingly found that the TWLC staff did well in preparing and presenting the science activities (39.6% “agree”, 41.7% “strongly agree”). With regard to whether staff were knowledgeable about the science content presented the majority, 58.7% “strongly agree” and another 34.8% “agree”. Figure 4.4 shows teachers positive assessment of the TWLC professional development staff.

Figure 4.4: Teachers’ assessment of TWLC professional development staff



Teachers’ assessment of the value of the time spent at the TWLC professional development program is related to their perception of the value of science in relation to the other content they have to cover in their classroom. This is particularly important to consider given that science is often perceived as less relevant for students in lower SES schools who are behind in the achievement gap on fundamental academic areas such as math and reading. However, the majority of teachers (89.6%) did not agree at all with the statement, “The time spent on these activities would have been better spent on other non-science curriculum.” Over half, 52.1%, strongly disagreed with the statement. Although 10.6% of teachers “agree” that the time they spent at the TWLC would have been better spent in their own classroom, 87.3% disagree including nearly 60% who “strongly disagree”.

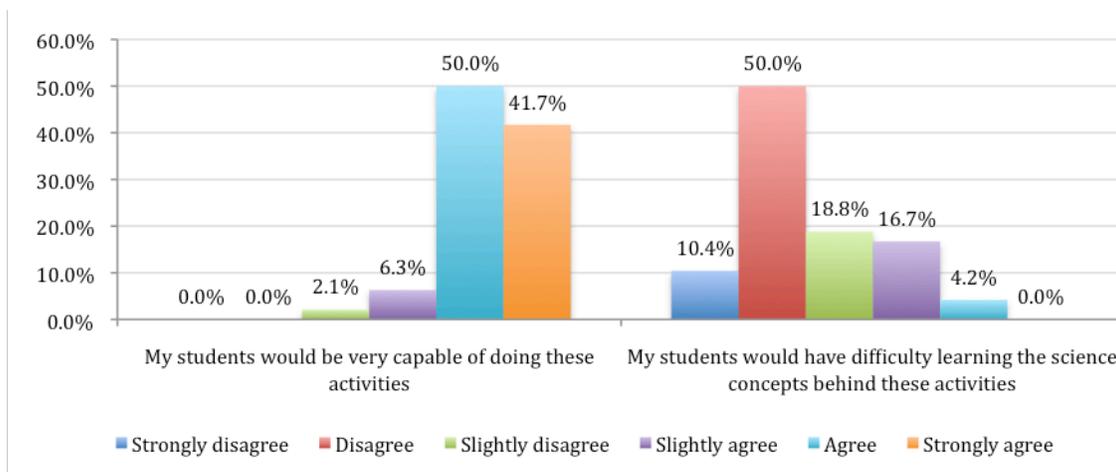
Figure 4.5: Teachers’ assessment of value of time spent at the TWLC professional development program



Teachers’ Perceived Capabilities of their Students to do the TWLC Science Activities and Understand the Concepts behind the Activities

Figure 4.6 shows teachers’ perceptions of their students’ capabilities for doing the activities they were presented during the TWLC professional development program. Over 90% said that they “agree” or “strongly agree” that their students are capable of doing the activities. And similarly, 60% said they “strongly disagree” or “disagree” that their students would have difficulty learning the science concepts behind the activities, with 18.8% “slightly agreeing”. Over 20% “agree” (4.2%) or only “slightly disagree” (16.7%) that their students would have difficulty with these science concepts.

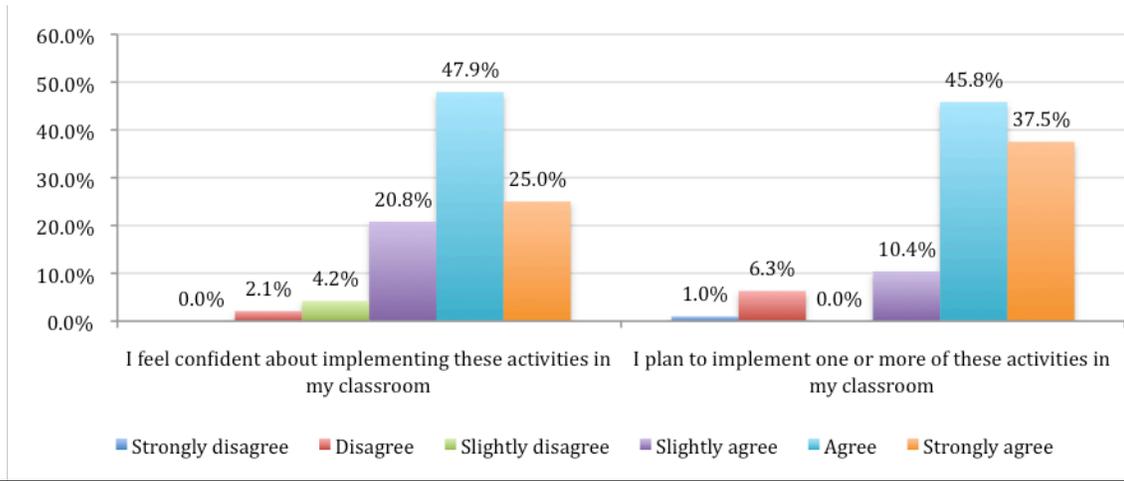
Figure 4.6: Teachers’ Perceptions of Students’ Capabilities



Teachers’ Confidence and Plans to Implement Activities

The majority of teachers indicated that they felt confident implementing these activities in their classrooms and planned to do so upon returning to their schools. A good portion of teachers completed the workshops feeling confident about their ability to implement the activities presented 72.9% (47.9% “agree”, 25 % “strongly agree”). However, 20.8% “slightly agree” and 6.3% “slightly disagree” or “disagree” indicating that over one fourth of teachers were not completely comfortable with returning to their classrooms to implement the activities learned while at the TWLC. Still, 83.3% stated that they “agree” (45.8%) or “strongly agree” (37.5%) with the statement, “I plan to implement one or more of these activities in my classroom.” Interestingly, 70% who returned for a second week to the TWLC reported in a survey that they had indeed implemented at least one activity (see Figure 4.7 below).

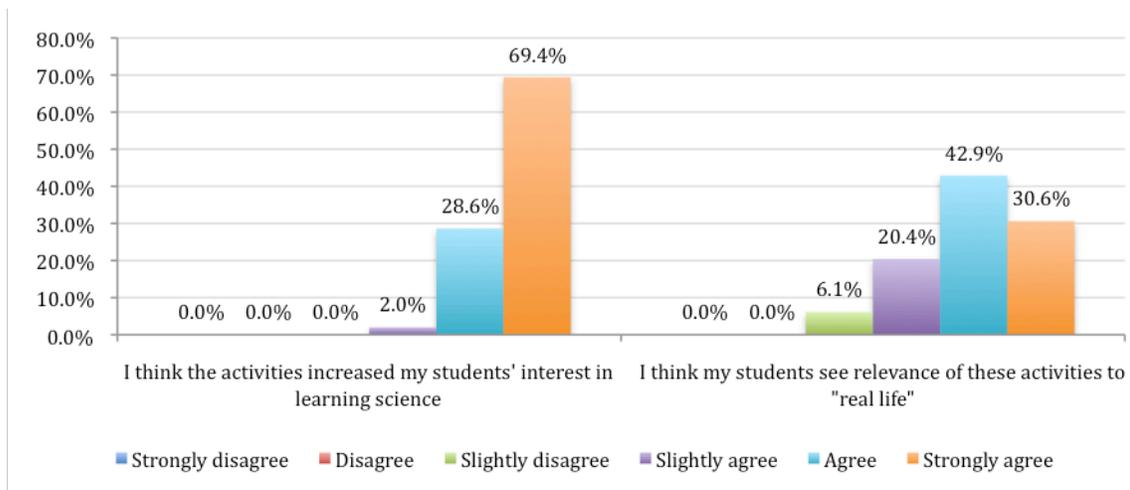
Figure 4.7: Teachers’ views of implementing the TWLC activities in their own classrooms



Teachers Perceive a Positive Influence on their Students’ Attitudes toward Science

Teachers also responded to survey items about their perceptions of the impact that the TWLC experience and forensic and marine science activities had on their students’ views and attitudes toward science. The majority of teachers 98% agreed that the activities increased their students’ interest in learning science, with nearly 70% saying that they “strongly agree”. Most of the teachers’ also “agree” (42.9%) or “strongly agree” (30.6%) that students were able to see the relevance of these activities to “real life.”

Figure 4.8: Teachers’ perceptions of impact on students’ views of science



TEACHER RESPONSES TO OPEN-ENDED SURVEY QUESTIONS ABOUT TWLC DAY PROGRAM AND PROFESSIONAL DEVELOPMENT PROGRAM

In post-participation surveys, teachers were allowed to respond to open ended questions about their TWLC experience. Teachers' written responses reflected many of the comments made by teachers who participated in focus group interviews regarding both their perceived benefits of the program for their students and their own professional development outcomes.

Teacher Perceived Benefit of Program Participation for Their Students

In the post-survey open ended questions teachers identified the positive aspects of the program for their students along five major themes: 1) the opportunity to engage in hands-on science activities that “spark interest in science” and “connect to the real world” 2) the provision of an engaging learning environment that allowed students to practice autonomy and build skills; 3) the opportunity to build positive relationships with the TWLC staff and the center's Assets development focus; 4) the emphasis on careers and exposure to information about how to get on and stay on a college path; 5) the exposure to gulf and other enrichment experiences during their week at the TWLC.

Thirty-four teachers wrote that the hands-on learning experiences were what benefited their students, with several noting the “real-life” application of science as a positive aspect. Twenty-three teachers made some reference to the high level of engagement of their students in the TWLC curriculum with many noting that they liked that the students were held to high expectations, were allowed to be “independent” and to “learn group and teamwork skills”. The activities and curriculum were described as “exciting,” “high interest”, and as promoting “higher level thinking,” and “fun while rigorous.” The uniqueness of the TWLC experience was recognized in comments that spoke to how students were able to do activities they “would not normally be able to do.”

Teachers provided a variety of positive comments about the program. For example, teachers appreciated that students were able to learn “note taking strategies,” “engage in academic conversations” and “complete creative assignments.” One teacher wrote, “It was educational, enjoyable and engaging; they are excited about the activities they've done and have mentioned wanting to come back on their own.” Another teacher wrote, “Students were excited to attend everyday and learned so much.”

With regard to the value of “integrating of technology in the lessons,” 27 teachers noted that this was a key benefit for their students. They appreciated the “state of the art facility: and liked “seeing technology taught through science.” Several noted how they liked that their students were able to experience “daily access to technology” in their learning environment and that they were able to “do research on the computers” and use “laptops” and other “scientific tools” like the “microscopes.”

Positive relationships and Assets development were mentioned by 19 teachers who spoke about the benefit of “meeting new people,” “interacting with various staff members,” and “working together” with peers from other schools. They noted the “high expectations” that staff held for

students and characterized their students' interactions with TWLC staff as positive. A few teachers gave a nod to the "positive teaching practices", sound "classroom management", and "awesome staff"; as one teacher wrote, "I really like how the students were treated by the staff."

An additional 21 comments were made to either the "college talk" or "career development" aspects of the TWLC program. Teachers wrote about the "the college-like" environment, "that makes kids feel grown-up;" and how "students felt like they were in a college setting and were treated as such." One teacher remarked on the "excellent exposure to different career fields." And similarly another teacher wrote that she liked her "students knowing that there are better options in life!"

Teacher Suggested Day Program Improvements

Out of 56 completed surveys, 17 teachers gave no answer to the prompt, "*The program for the students could be improved by...*" Another 14 offered general positive remarks instead, either stating that they would change nothing or that the program "was great!" "Awesome" or that they would like to come for "a longer period" "more often", or that "two weeks would be great."

Several teachers (11) spoke to the need to align the program more directly to content standards and to the fifth grade science curriculum they are charged with teaching in their classrooms. In this respect a teacher recommended, "More direct application to specific fifth grade standards in preparation for the 5th grade STAR Science Test. (Sorry, but it is about the test!)" Two teachers recommended expanding the Day Program curriculum to other areas of science: one suggesting "focusing more on biology standards required for 5th grade in anatomy, or plants, perhaps addressing a different career in each field per day, with related experiments;" another to "model different types of science (physical, life, earth)."

Other teachers' suggestions for improvements to the TWLC Day Program for students addressed various issues. Two teachers noted "smaller class size" that reflecting the TWLC staff concern for the overcrowding in the classrooms. Two teachers mentioned that they would like to have a say in the formation of the student grouping for their classes at the TWLC. Another teacher expressed a concern for the undifferentiated instruction: "All the lessons seemed to be based on the idea that all students are working at the same level. We brought students who were in Special Education to students who were in GATE."

A few teacher's suggested that students be given a choice in the enrichment class that they do at the end of the day, or that the TWLC should "improve enrichment choices" offered, or rotate students through different experiences, citing that the drama was less engaging than "making movies, comics or robotics." As one teacher noted, "Some students in the performing arts weren't too excited by this while the others were using computers for various projects."

A teacher concerned with the better dissemination of the opportunities available to youth at the TWLC suggested, "Getting the teachers in Anaheim in for an assembly/meeting to let us know about the TWLC. I feel like more community kids would come to after-school programs at TWLC if the teachers in the community knew more about the programs offered here."

Teachers' Positive Assessment of Professional Development Program

Teachers were asked to comment on the “positive aspects of the professional development program” and responded with generally positive comments about the experience in terms of the quality of the workshops and the relevance of the information provided to their classroom instruction. Only 3 out of 56 declined to respond. There were 21 comments related to the value of the hands on science activities presented in the workshops for teaching their students in the classroom. A few made specific reference to the activities helping them “teach the standards,” and that “the program was tied to the science curriculum we use.” Two teachers wrote that they found the science lessons helped to “explain difficult concepts” to students. Teachers appreciated the “great teaching tips,” and “review of science concepts” they had “not heard in a long time,” and “quick ways to implement thought provoking experiences.” As one teacher put it, the workshops served to “demystify science hands-on activities.” A teacher remarked, “I am so excited to apply what I learned here and am ready to implement.”

A number of teachers (8) stated that the introduction to the 40 Developmental Assets and to the *Start Something* book and curriculum were positive aspects of the training experience. In this regard a teacher wrote, “We enjoyed receiving the Start Something book. We all plan on using it in our class as a resource.” Another echoed, “I will definitely implement the *Start Something* book in my class.” Another teacher added that the Assets development component of the TWLC professional development experience was helpful in providing “reminders of what’s important with regard to relationships.”

Although there were fewer teachers who came for a second week and were exposed to the workshops, 5 teachers valued getting “ideas to integrate technology” in the classroom and learning how to use “Moviemaker”. One teacher emphasized that she “learned so much about digital storytelling with ideas on how to use it.”

Another dozen general comments referred to various aspects of the professional development experience that teachers enjoyed. For example, teachers commented that it was “interesting and well paced, relevant,” and “not too overwhelming.” Three rated the TWLC staff highly describing them as “knowledgeable, informative and professional” and “friendly”. They also expressed appreciation for the “flexibility” and “no-stressful” approach of the workshops, and the “good interactive communication with staff.” Several mentioned that they enjoyed the opportunity to meet other teachers—“the collegiality with other schools”—and dialogue with their peers about teaching in a relaxing setting, “expanding my knowledge”. Five teachers noted that the time allocated for grade level planning was helpful. Some also pointed out that they enjoyed observing their students “practicing science in the [TWLC] class.”

Teachers' Suggested Improvements to Professional Development Program

Of the 31 responses to the prompt, “*The professional development program could be improved by...*” five teachers stated that they “loved it!” and that it was “great the way it is,” and that they would change, “nothing”. The 27 remaining responses were mainly around three themes: 1)

providing more of the same; 2) aligning to the school curriculum; 3) quality of the workshop instruction; and 4) a few miscellaneous comments.

Five teachers asked for more of the same: “more experiments,” “more mini-lessons,” “more technology,” “more ideas and experiments,” and “just more!” Also it was recommended that they “allow teachers to participate in some of the activities that the kids are doing,” as one teacher stated. Another further argued along these lines for “more information about what our students are doing and learning about so that we can converse with them to ensure they’re getting the full benefit of the lessons.” A teacher added that it would be good to have copies of the “student hand-outs and lab-notes” too.

Six teachers made reference to the need to align the activities presented in the professional development workshops to the school science curriculum and state standards. One teacher called for making the curriculum “more directly correlated to what we need to teach,” and further added, “Honestly, we already have so much training and professional development in our district. This was way inferior to our regular professional development.” Other comments about the content and relevance of the workshops were focused only on the need for greater alignment with the school science curriculum and expansion into other science areas, with two teachers proposing a longer period in order to cover more material. The teachers’ comments are as follows:

- *Unwrapping the 5th grade standards, backward planning of science lessons*
- *Adding more lessons from 4th/5th lessons such as planets, etc.*
- *Modeling experiments from the District’s adopted curriculum so these don’t become “more to do” experiments, but practical applications*
- *Including other science areas, such as Life and Earth science*
- *Ideas relating to other sciences (Life Science, Earth), longer student program would bring more time for professional development*
- *Different ideas for Life/Earth Science as well (not just Physical)*
- *Relating science activities to specific parts of science teaching to facilitate planning [and] more discussion of review of Start Something materials*

Two teachers suggested extending the duration of the program to two weeks which would allow for more science topics to be addressed.

- *Incorporating Life Science and Earth Science. This is where a 15 day program could be a benefit (1 week for each topic)*
- *Continuing this program every year for 5th grade. Creating a two-week program taught as 2 separate weeks (Week One- 1st half of school year, Week Two- 2nd half of school year.) I would love if they could teach physical sciences one week and life science the other week.*

Other suggestions for improvement addressed the quality of the workshop presentation and basic components and structure of the workshops. For example, two teachers requested more visual support in the delivery of the content: “Power points of materials being spoken so we aren’t looking at the back of the instructor while trying to take notes;” stated one teacher, and “providing some tools to take home or visuals of what we did,” added another. Two requests were made for presenters to “slow down” to allow teachers to process the science concepts and activity steps being introduced to them.

Another teacher commented that the program needs to be “more structured with more to do,” and another requested “a daily schedule of events.” One teacher made the specific request for “tubs of materials for the matter unit.” And another asked that they include some orientation on the “Faces” software the students learn.

Additional Teacher Comments

Forty-four teachers offered additional comments about “any aspect of the TWLC Experience.” The majority of teachers' responses to this open ended prompt were highly positive with only a few comments pointing out problems or suggesting improvements. One teacher reported that one of the facilities' staff (not instructional) had been “rude” and “disrespectful” to children and teachers, making that negative interaction “the one ill fitting piece in an otherwise superb experience.” Another teacher was “peeved” to see “a Grey Goose Vodka sponsorship square in the concrete” at the TWLC entrance, and explained, “I just think it’s sending the wrong message and our kids are already bombarded with alcohol advertisements everywhere else they look. Recommend a silent partnership with that one.”

Three teachers visiting the same week mentioned that they were dismayed to see “so much movie watching” by students while they were at the center. One added, “more hands-on or reflecting during down time would be improved.” One asked that the lights in the classrooms be checked, as “they seem to be dark. Both teachers and many students complained to have headaches that may be attributed to the lighting.” Again, the idea that teachers should be involved in the assignment of students to their TWLC classroom groups was presented, “It would be beneficial to allow teachers to choose which groups to put children in based on interests and child group combinations;” and the idea that “students could have free choice about what to do for enrichment activities,” was suggested again here.

Some teachers felt that one-week was too much time, while others stated that it was not enough time. As one teacher commented, “I feel 3 days would have been enough time to devote to student participation in the program. There was a feeling of too much ‘down time’ especially with viewing of the Disney movies.” A teacher who attended two weeks stated, “one week would have been better,” which would allow the TWLC to serve “more kids,” and added that having students come “during off- track” or “after school” would be “great too!” Another teacher expressed that she wished they had “more time to spend with students out on the golf course.” In general comments were overwhelming positive with teachers expressing gratitude for the opportunity to come to the TWLC through positive phrases such as:

- ***Thank you for the opportunity. The kids loved it.***

- *This is an awesome program.*
- *This is a great place for students to be a part of!*
- *Thank you! Our kids loved it and I think it will be a positive experience for them.*
- *This was a truly amazing experience for my students as well as for staff. Thank you!*
- *Great experience for the kids, great golf exposure, super computer programs, nice variety of media use, very inspirational.*
- *Thank you! A great experience, motivating for students, provides exposure to real issues and opportunities.*
- *This is a fabulous opportunity for students to have a valuable, memorable, unique experience. They are blessed to have been given this opportunity. I know they'll look forward to returning.*
- *Great program definitely an asset to both teachers and students.*
- *This was a fantastic week for both the students and teachers. This is a wonderful program. Thank you!*
- *Thank you from me and my students.*
- *Thank you so much for this opportunity.*
- *Wonderful experience overall.*
- *It has been a great experience!*
- *TWLC was an awesome experience for both teachers and students.*
- *Thank you, Thank you, Thank you!*
- *Thank you so much!*
- *LOVED IT!*
- *This was a wonderful, powerful experience.*

Several teachers stated that they looked forward to returning and hoped that their students will continue to attend the TWLC into the future.

- *I would love to have students come every year to experience this Week.*
- *I have really enjoyed my week here. I would love to come back next year for 1 or 2 weeks! Thanks of having us. It was very useful!*
- *This is a GREAT program and I hope we can come back next year and do 2 weeks.*
- *I liked coming here and would love to come back with next year's 5th graders as well.*

- ***I am overwhelmed at the awesome time teachers and students had at the TWLC. I hope all students who came here for the week continue to use the facility until college.***
- ***I thought the experience at TWLC was great for the students because many of them have never had such an experience as this. It also gives them a chance to learn about careers they'd be interested in. It gives them hope for the future and also a chance to be a member of the TWLC.***

A teacher argued for greater dissemination of the program to the community and proposed that a shuttle bus pick up students from a junior high school in the neighborhood.

Let teachers know about this wonderful resource for our students. The TWLC is a gem. More kids need to know about it. I think more should be done to get the word out in the community to parents and teachers about what TWLC has to offer. I know many teachers who have said they would like to know more. A shuttle bus pick-up/drop-off at South Jr. High would be nice.

Teachers also recognized the high quality staff at the Center with the following comments:

- ***Staff from TWLC was very positive and professional.***
- ***The staff was awesome!***
- ***I think the staff was great! I saw many positive interactions between the children and staff. I also enjoyed the professional development.***
- ***Staff was amazing. Marjorie/Melissa did an outstanding job!***
- ***Teachers were great with the students.***
- ***Wonderful 2 weeks. Beautiful facility. Very positive and helpful staff.***
- ***I love everything about it. The staff is AWESOME!***
- ***The teacher development part was very useful and Kelly was so helpful.***
- ***My daughter attended as a 5th grader and it has been a very positive experience. She has a new sport (golf). When she'd been gone for a few months, Mr. Gonzalez called her and told her about the softball/golf workshop. She was unable to attend but the fact that he remembered her love of softball and took the time to call meant so much. He's a great role model and it's just one more example of how the staff truly cares about kids.***

Although teachers expressed a few concerns and made some recommendations for program improvements, in general they expressed positive perceptions of the quality of both the student and adult programs at the TWLC and indicated that they were interested in participating in future sessions. Some perceived the Center as representative of the kinds of educational practices that should inform regular schooling, as reflected in this teachers' statement: "This was an incredibly valuable experience and should be used as a model for direction public education needs to take."

RETURNING TEACHERS' IMPLEMENTATION OF TWLC ACTIVITIES IN THEIR CLASSROOMS

Teachers' Responses to Open Ended Survey Questions about Activity Implementation

As part of the pre-survey of teachers returning to the TWLC for a second week, they were asked to respond to the following open ended questions: *"If you did implement one or more of the TWLC activities in the classroom, what worked? What didn't work?"* Sixteen survey responses in total were collected from teachers attending three separate sessions. Eight teachers did not respond to this prompt, and 8 responded. Seven teachers reported that they had implemented the science activities. One teacher was unsure, stating, "They implemented the lessons into our rotations, I do not do the science so I am not sure."

With regard to what worked, a teacher stated, "Students understood the concept of what a mixture is [and were] very excited about the activities themselves." But the same teacher added, what "didn't work" was that "even though reviewing the rules, kids seemed to get overly excited with the balloons while doing the salt/pepper activity." On the other hand a teacher who attended another session remarked, "I did the balloon and salt/pepper experiment. It worked out beautifully."

Other positive feedback on the implementation of science activities provided by the remaining respondents was as follows:

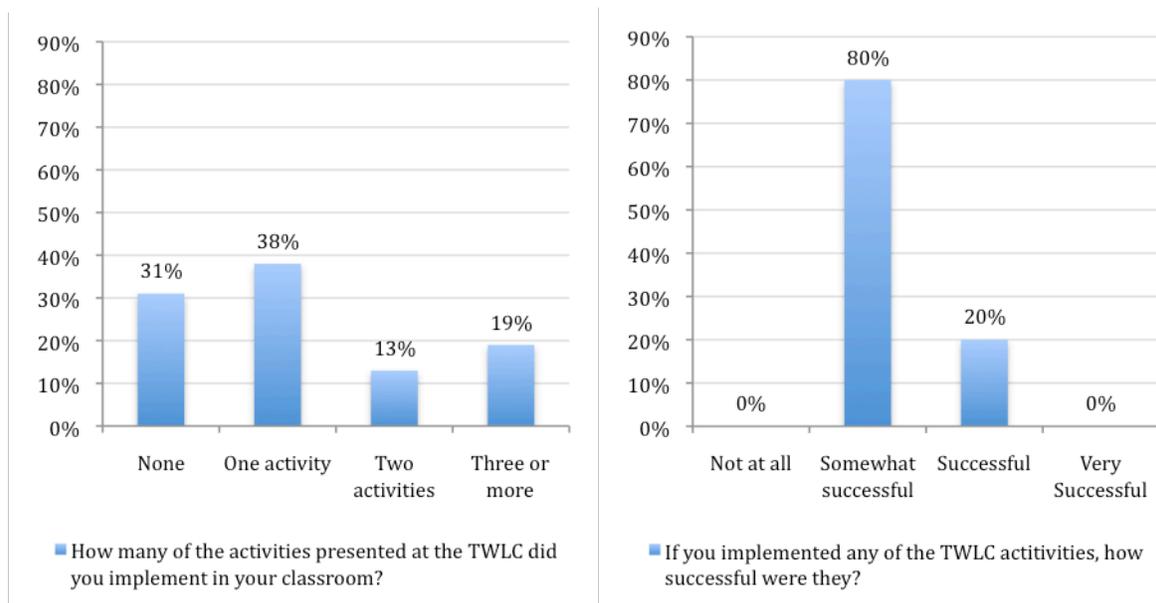
- *It worked well. The kit needed to have more working batteries though.*
- *The hands-on circuit was awesome refresher for my students.*
- *The science kits were accessible and very organized. Saved planning time because the kits were available to check-out.*
- *We just started Physical Science. We (I) have done the activity with iron filling, salt and pepper to demonstrate mixtures. Everything went well.*
- *We have done the iron shaving mixture activity and the salt and pepper balloon activity. Both were perfect! Thank you for the idea of the plastic over the magnet—this really helped with cleanup. I am looking forward to completing all of the other activities—they are wonderful.*

Five teachers responded to the question *"If you did not implement one or more of the TWLC activities in your classroom, why did you choose not to?"* Three teachers who attended a second week in early January 2008 explained that they had not had the opportunity to do the activities but that they intended to do so in the coming weeks. They each explained: "I will do so, but I haven't taught the science (matter unit) since we left," "I will eventually implement it in my class," and "I didn't have an opportunity to but will after this visit". One teacher simply wrote the word "time" and another stated that they only attended two days of the training and had to leave early for personal reasons. Only one teacher indicated that they did not find the activities to be valuable and wrote: "I already do other things that are more relevant to student learning."

Teachers Implement Activities and Perceive them as Successful

In addition to open-ended questions on the Week Two Pre-participation survey regarding their experience implementing science activities in their classrooms since completing the Week One program, teachers were asked to respond to two related survey items. Teachers were asked how many of the activities that were presented at the TWLC did they implement, and if they did implement any of the TWLC activities, how successful were they. Nearly one third of the teachers surveyed (31%) reported that they did not implement any of the science activities presented in Week One. However, 70% reported doing at least one of the activities (38% did one, 13% did two activities, and 19% did three or more). Of those teachers who did do an activity, 100% reported that it was either “somewhat successful” (80%) or “successful” (20%). No teachers choose “not at all” or “very successful,” as presented in Figure 4.9 below.

Figure 4.9: Week Two Pre-Participation Survey, Implementation of Week One Science Activities



SECTION IV – CONCLUSION

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Schools in lower SES communities, which also frequently have a large population of students who are English Language Learners, often focus on basic academic facts and skills. Often, science content is devalued—the sciences are not covered well, are not taught regularly, and are presented completely through lecture, without hands-on activities and without connections to real-world applications and careers. For the students in these schools, science is frequently perceived as irrelevant, or as a low priority in comparison to other content. For the teachers in these schools, who are held accountable for their students' test scores, the time and effort required for implementing hands-on science instruction may seem a poor investment.

During the 2007-2008 school year, the Tiger Woods Learning Center (TWLC) sought to address these concerns, through the implementation of a new Day Program model for 5th-6th graders and a concurrent Professional Development Program for school teachers. The primary goals of the Day Program were to instill interest and enthusiasm toward science as well as interest and optimism toward future college and career aspirations. The primary goals of the Professional Development Program were to present concrete strategies for implementing hands-on science activities, to increase teachers' sense of efficacy toward science content and instruction, and to promote an Assets-driven approach toward teaching.

Overall, the programs had a positive impact on both students and teachers. Within a single week, students showed a small but significant gain in science efficacy and positive future outlook. A large majority of them also expressed interest in returning to the TWLC for Saturday activities and for the After School Program. Most of the teachers in the Professional Development Program also showed a positive gain in efficacy in science instruction. In open-ended survey responses and in focus-group interviews, many teachers expressed several specific reasons why they believed that their own experience at the TWLC, and that of their students, was positive and worthwhile. A majority of the teachers also noted the excitement and enthusiasm of their students, and a strong interest in returning to the TWLC with future classes.

There were two main challenges of the Day Program, as reported by TWLC staff: difficulty in covering science content and concepts in the short one-week session, and difficulty establishing relations with students, due to the short time-frame and to the large numbers of students in each class. The Assets-driven approach, which is one of the cornerstones of the TWLC mission, was necessarily compromised. The main challenge of the Professional Development Program was to explicitly align the TWLC activities with state curriculum requirements, in a way that was both instructionally effective and time-sensitive. Attention to this issue is perhaps the most critical, because in order for students to participate at the TWLC, their teachers must give up one full week of valuable instructional time.

For future implementation and success of the Day Program and the Professional Development Program, the TWLC will need to continue to examine and balance the various conflicts they are already aware of, that are supported by the results of this evaluation: 1) serving large numbers of students each session vs. establishing meaningful relations among youth and adults, 2) aligning instruction with state-mandated curricula and covering enough breadth of content, vs. becoming “too much like school” and losing the focus on deeper conceptual understanding, 3) maintaining the one-week model, which is most convenient for schools and teachers, vs. allowing enough time to have a meaningful impact on students’ learning of science and their future aspirations for college and career, and 4) providing teachers with specific procedural, skills-based examples of hands-on activities, vs. promoting a more conceptual, Assets-based approach to teaching science.

Certainly, the TWLC made much progress toward achieving its objectives with the new Day Program model and the Professional Development Program, and experienced success in many areas of both programs. Hundreds of students and their teachers had a chance to experience the TWLC program and facilities, and benefited from the TWLC’s Asset-based, hands-on instructional approach to science. Further, due to these positive experiences, many students are now likely to return to the TWLC for the After School Program, and teachers from several schools are likely to further promote the TWLC to other teachers, students, and parents.