Clean Technologies Early College High School

Summer 2014 Program Report: Ninth-Grade Program Launch

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Ballston Spa, New York
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THE PAST FOUNDATION

OVERVIEW OF THIS REPORT

During the spring quarter of 2014, the PAST Foundation provided support for the Clean Technologies Early College High School (Clean Tech) preparation for the first cohort enrollment of ninth-grade students entering high school in fall 2014. The first report issued in June 2014 tracked the early stages of planning, including outreach and recruitment strategies for opening enrollment to eighth-grade students from across the region seeking STEM education as a component of their high school course work. The report, "Program Design for Ninth-Grade Enrollment, Fall 2014," outlined regional recruitment efforts conducted by Clean Tech in collaboration with middle schools, and identified key issues and challenges for increasing enrollment of under-represented students, including females as well as at-risk and disadvantaged youth.

This report documents planning and implementation for conducting a 9th grade five-day summer bridge program held at the TEC-SMART campus during July 2014. The Clean Tech summer program hosted (73) ninth-grade students led by four Clean Tech instructors. Support provided by PAST included professional development for the Clean Tech instructors (June 30 to July 1, 2014), as well as on-site coaching and formative evaluation conducted during the five-day summer program. The latter included observation of student and teacher interactions, and involved administration of a mid-week student survey (day three). Focus groups were conducted at the end of the program with five Clean Tech instructors, and with a group of eight students who volunteered to take part in a focus group.

The following sections of the report include a summary description of the two-day professional development and goals for the 9th grade program design. Focus group data provides the basis for analysis of the program from the perspective of the teachers as well as from views held by students gained through structured dialogue held during the summer program. Together the focus group data for both teachers and students offer a context for considering the achievements of the launch of the first ninth-grade cohort. Issues identified in a 'work-in-progress' review of the program explores targeted areas of program support as teachers and students enter into a new, collaborative learning experience based on mutually defined expectations and strategies for academic success, and for developing critical skills including establishing new social roles and relations.

CLEAN TECH INSTRUCTOR PROFESSIONAL DEVELOPMENT

As part of the preparation for the incoming 9th grade cohort, teachers at Clean Tech Early College High School participated in a two-day professional development (PD) workshop led by the PAST Foundation (June 30 and July 1, 2014). The goals for the two-day PD workshop were to:

1) Plan the five-day summer bridge program for the 9th grade cohort
2) Plan the first quarter for the 9th grade cohort
3) Learn new planning and teaching strategies to build upon the existing integrated STEM education for the Clean Tech ECHS Program

Teachers were given the following materials in advance to prepare for the two-day PD: Course content for the online class titled, *P3: Introduction to Transdisciplinary Problem-Based Learning* and the corresponding workbook, *Problems > Projects > Products: Designing Transdisciplinary Problem-Based Learning* by Sheli Smith, Ph.D. and Annalies Corbin, Ph.D. (September 2013).

P3 Course

The content for the PAST Foundation's online course, *P3: Introduction to Transdisciplinary Problem-Based Learning,* was made available to the Clean Tech ECHS teaching team via Basecamp™ on June 2, 2014. Clean Tech faculty had the option of accessing the course material at their own pace in preparation for the two-day professional development with the PAST Foundation. Teachers reported that the teaching team watched all of the course podcasts together as a group during one session.

The P3 introductory course provides an overview of the instructional strategies associated with Transdisciplinary Problem-Based Learning (TPBL), a 21st century model used to deliver integrated STEM instruction. This course covers the antecedents of the process as well as the innovative system used to develop a culture of learning that resonates with the specific community in which the instruction is delivered. The process explores all components of building a TPBL educational environment, including establishing school habits which impact a school's instructional climate, demonstrating gained knowledge, and benchmarking progress in ways that define success for students and teachers. Each of the eight PD modules in the P3 course has three parts: 1) informational podcasts; 2) extension activities that include videos and 2-3 corresponding discussion questions; and, 3) planning templates/deliverables.

The titles for each module are listed below:

1. Introduction to TPBL
2. Problem Development for TPBL
3. Principles of Design
4. Building TPBL Modules
5. The Lewis Rubric
6. Aligning Standards to TPBL Modules
7. Short Cycle Assessment
8. Fidelity and Benchmarking

Workbook

Copies of the workbook, *Problems > Projects > Products: Designing Transdisciplinary Problem-Based Learning*, were sent to program administrators and faculty at Clean Tech on June 8, 2014. The workbook corresponds with the P3 course and is process-driven, offering hands-on templates for designing and implementing 21st century education. The step-by-step process outlined in the book is intended to help instructors and community partners build robust and sustainable environments that engage the learning team of teachers and their students.

Professional Development Formative Feedback

To maximize the two-day professional development, teachers were given resources in advance of the on-site training to become familiar with PAST's TPBL planning process. As part of the initial design for professional development, PAST constructed a Socrative™ survey to assess understanding of the TPBL process. Teachers were given the Socrative™ link on the first morning (June 30, 2014) of the two-day PD. The following four questions were asked:

1. What is the purpose of a problem?

2. What is the difference between a project and a product?

3. How does pre- and post-assessment drive real time course correction?

All teachers who participated in the two-day PD responded to all four questions. Teacher responses to the four Socrative™ questions demonstrated alignment with the P3 course objectives and understanding of the TPBL process. In response to the questions, "What is the purpose of a problem?" and "What is the difference between a project and a product?" teachers were able to distinguish differences in the hierarchy of problems, projects, and products. Products are the tangible demonstration of learning, while the project is the process used to get to a solution. Teachers reported that the problem provides authenticity and relevance to learning, while giving students the opportunity to develop multiple solutions. In response to the question, "How does pre- and post-assessment drive real time course correction?" respondents reported that assessment allows for individualized instruction and informs teachers about the student level of understanding in order to differentiate instruction. In response to the question, "How does presentation of learning to an authentic audience affect project management?" teachers reported that having a deadline with a real purpose supports student engagement and ownership.

The Socrative™ survey provided formative feedback to the PAST PD team, validating readiness of the Clean Tech teaching team to move forward with the PAST approach to the TPBL planning process. Additionally, the Clean Tech teaching team has three to four years of experience with integrated STEM education, therefore use of the Socrative™ survey provided a tool to tailor the approach appropriate for the Clean Tech PD workshop, building on existing teacher skill levels to maximize the two-day PD in designing the plan for the 9th grade summer bridge program and the first quarter of the fall 2014 academic year.

In the following sections of this report, focus group and survey data are presented to offer further understanding of the five-day bridge program experience, including challenges and achievements identified by the Clean Tech teaching team, and student views on the accomplishments of the bridge program.

SUMMER BRIDGE PROGRAM

The summer program was conducted Monday, July 14 through Friday, July 18 at the TEC-SMART campus and was attended by (73) 9th grade students. Support provided to Clean Tech instructors by an onsite PD Coordinator, and engagement with instructors and students by the Knowledge Capture Program are reported here. The Knowledge Capture staff conducted a student survey (mid-week), and two focus groups, one with instructors and one with students, to gain insights on summer program design and expectations for the 9th grade Clean Tech Program.

On-site Coaching

The PAST Foundation staff provided on-site coaching to the Clean Tech teaching team during the five-day summer bridge program. The on-site coaching assisted with real time course correction for implementation of the plan designed during the two-day PD to launch students on their first project. The summer session project asked students to consider possible ways to maintain critical communication within communities, as well as between communities over long distances during times of difficulty such as natural disasters. The PAST Foundation PD Coordinator worked directly with teachers and with administrators during the five-day bridge program, conducting daily review and planning sessions with the Clean Tech teaching team. The PD Coordinator also conducted observation of daily instruction and student activities, providing feedback as well as guidance for implementation strategies to support on-site real time course correction. Daily observation was also supported through formative evaluation conducted by the Knowledge Capture Director in coordination with the PD Coordinator. Daily review and planning sessions provided the opportunity for the Clean Tech instructors to reflect on daily objectives with input from the PD Coordinator and Clean Tech administrative team.

Clean Tech Instructor Focus Groups

Focus group discussion with five instructors was conducted at the conclusion of the program, giving instructors the opportunity to reflect on the summer program and consider emerging perspectives on issues and challenges for the coming 2014-15 academic year for the 9th grade program. The issues identified throughout the discussion were framed by focus group questions concerning strategic approaches to future program planning and program design.

Teachers' observations about the summer bridge program included ways to restructure the schedule to meet program objectives by designing a program of half-day sessions for students. Teachers noted that half-day summer program sessions would allow instructors time to work collaboratively in extended daily planning sessions. These planning sessions would provide teachers with time to review initial assessments of developmental differences in freshmen-level students, and create strategies to enrich activities in ways that address those differences.

This proposed restructuring was also viewed as being more consistent with best practices established by the Clean Tech teaching team who work daily in collaborative strategy sessions to identify and respond to emerging student needs during the course of the regular academic year. In this approach, it was also suggested that it would be beneficial for students to attend two five-day summer sessions, as opposed to one summer session designed for six-hour days. Holding two summer sessions (2-3 weeks apart) would provide extended face-to-face time for students and instructors, and increase time for appraisal of grade-level skills. The extended timeframe would also allow students to more fully absorb program objectives, as well as build essential communication skills and gain a more in-depth understanding of program expectations of students entering the 9th grade.

A final view of the summer program expressed by instructors concerned the potential for bringing in other teachers to support 9th grade students during the summer session. This involves including 8th grade instructors during the summer session to assist with identifying developmental differences. Additionally it was observed that involving 8th grade instructors during the summer session could provide opportunities to build experience and training in problem based learning in Clean Tech feeder schools.

Observations about the 9th grade program design overall involved views on increasing planning time in the future, as well as PD to support curriculum development. Ideas centered on designating time to assure that instructors develop effective strategies throughout the year for 9th grade students who will engage primarily through an online system supported by CANVAS®. Consideration of approaches via online interaction for mentoring students, as well as structuring dedicated time to focus on 9th grade students throughout the school year were raised as important components of the 2014-15 program envisioned by the instructors.

Discussion of this aspect of the program also included the potential for bringing on additional instructor support for online student interaction, for teaching online courses, or assisting as a co-teacher. Industry partners were also identified as a source of potential ways to provide additional resources for classroom support and should be explored further as the Clean Tech program expands to full 9-12 grade level enrollment.

Additionally, instructors agreed that a priority for the 9th grade program would be to establish opportunities for face-to-face engagement with students during the academic year, when instructors will also be involved with 11th and 12th grade students. This was raised as a challenge that could be met by designating regular opportunities to engage with 9th grade students to address particular needs. Teachers also identified a key challenge regarding having sufficient engagement to address grade-level skill development, and assure that students advancing through the 9th and 10th grade Clean Tech Program will achieve academic readiness for entry to the 11th grade program.

Student Survey and Focus Group

A student survey was conducted on day three of the summer session, followed by a student focus group dialogue held on the last day of the summer program. The student focus group was designed to explore survey questions further, probing student views about the summer program as well as expectations of the Clean Tech program. Analysis of the focus group discussion is presented first, noting that student observations expressed during the focus group were generally consistent with survey responses from mid-week. However, discussion about the program on expectations for the year ahead were mainly focused on student experiences during the week with Clean Tech instructors, which was not as evident in the survey responses from earlier in the week. Focus group discussion about the Clean Tech program suggested that students experienced a significantly different interaction than they had experienced with other instructors in the past. The tenor of the discussion among the eight students reflected a positive outlook on their ability to achieve academic success because of the quality of instruction experienced during the five-day summer session, and expectations of the program as a whole to support higher academic performance.

Focus group participants volunteered to join the discussion, and included four females and four males (n=8), representing four of the eleven school districts. In reviewing the survey questions, students were enthusiastic in their views of the program and opportunities they anticipate will occur to support their goals for attaining exciting careers in new fields, and increase the probability of entering college in order to enter a STEM-related field. This included the idea that the early college program will reduce the cost of college overall, which was described as a definite advantage.

Identifying their favorite subjects in middle school, students noted science and math, technology as well as social studies. Several students commented that they had the opportunity to take a "STEM" class where they learned about nanotechnology, forensics, robotics and rockets.

Obstacles to entering the program centered on their experience with transportation to the TEC-SMART campus during the summer session. However, all students thought this was a minor problem their parents could contend with, and anticipated that they would be in a position to transport themselves by the time they entered 11th grade, even while acknowledging as much as a 30-minute commute.

The majority of discussion topics among the eight students included anticipated differences between their home high schools and the Clean Tech Program focused on teacher engagement and teacher expectations. All students commented that the summer program had given them a very positive and strong sense that Clean Tech instructors are dedicated to their academic success. This was in contrast to many observations about prior experience, where lack of engagement with teachers was a common theme among the student participants. All acknowledged that they had good relations with their teachers in the past, but felt that they seemed satisfied with being "good" in a subject, and that expectations were not as high, or that school was not as challenging as they expect of the Clean Tech program.

When sharing views about the work completed during the week, students commented positively on teamwork, communication, and making a deeper connection with their Clean Tech instructors than they had expected. One student mentioned that instructors knew her name by the end of the week when no one wore a name tag, which she found surprising given the large student group of over 70 students (4005-214).

All students commented that teachers were approachable, interested in their questions and in communicating clearly and effectively about the work underway. Students also noted that the teamwork process was very different than they had experienced in other classes because everyone had a defined role. This made it possible for everyone to do their work because they understood what was expected, rather than simply not participating and letting the others on the team do all the work. The clarity of instruction and expectation for each member of the team created an experience in which they were able to work with students from different schools, noting that it was possible to work as a team despite not knowing each other because they could rely on their role on the team to engage with their fellow team members.

The concept of collaboration was also viewed as an essential aspect of teams with defined roles, where no one team member takes control or dictates to the group. Collaboration was associated with being mature, recognizing that work was a priority over socializing during class time, and eliminated conflict among the team members about the process for completing the assigned tasks. Collaboration was associated with good communication. Students commented that virtual communication using CANVAS® or other social media would allow them to "collaborate whenever we need to," whether at school or at home (4005-131).

Freedom to explore to attain new knowledge was identified by students as an important aspect of their experience during the summer session. In the context of the week's work, this freedom was considered a key element of "thinking outside the box," and independent learning (4008-186). The real-world aspect of thinking about communication in the context of natural disasters also injected a sense of purpose, reinforcing both the need to work through the project to completion, and in laying groundwork for real solutions to overcoming obstacles to communication. The latter was recognized by students as a "real situation" requiring skills they will need during the coming academic year when they will work virtually with their teammates on their projects during the 2014-15 academic year.

Finally, the quality of instruction and the instructors' style of communication was described by all eight students as creating high expectations of themselves and of their experience to come as freshmen in the Clean Tech Program. One student commented that because they could attain a higher level of academic success, it would be possible to assist other students at their home high school who are struggling in their schoolwork. The student observed that he expected he could help others to learn in ways taught in the Clean Tech Program using skills he will have that other students might not (4006-174). Students also shared awareness that the summer program was

itself "re-engineered" during the course of the week. This involved shifts that occurred due to unexpected delays with computers and technical glitches with accessing their Hudson Valley Community College online account (4008-223). This experience created awareness of problem solving through modeling of problem solving skills exhibited by program instructors and support staff, including technical support staff and Hudson Valley students who also came to the campus to assist with technical support.

At the conclusion of the discussion students shifted their focus to consider the skills they thought they would acquire during their four years in the Clean Tech program. Many of their observations concerned preparing for college and career. When asked to comment on the potential skills students thought they would gain, attaining real knowledge and understanding was noted in contrast with more than just "giving out homework" and "taking a test on Fridays" (4006-218). One student summed up by observing that it's not so much about what should be learned in the Clean Tech program, but what do students *want to learn* while in the program (4001-219).

In the following and concluding section of the report, analysis of the student survey conducted on day three of the summer program is presented.

Student Survey Overview

An online survey was conducted with Clean Tech ECHS 9th grade students on July 16, 2014. The survey was administered via Survey Methods© to students on day three of a five-day summer bridge program, conducted Monday July 14 through Friday July 18 at the TEC-SMART campus. Of the (73) 9th grade students enrolled in the summer program, 96% (70) completed the survey. These (70) students represent (11) PreK-12 school districts participating in the first 9th grade cohort, enrolled in the Clean Tech ECHS Program for the 2014-15 academic year. Student survey participants utilized their Clean Tech laptop computers to access the online survey posted on a web-based platform (www.surveymethods.com) that supports anonymous survey administration.

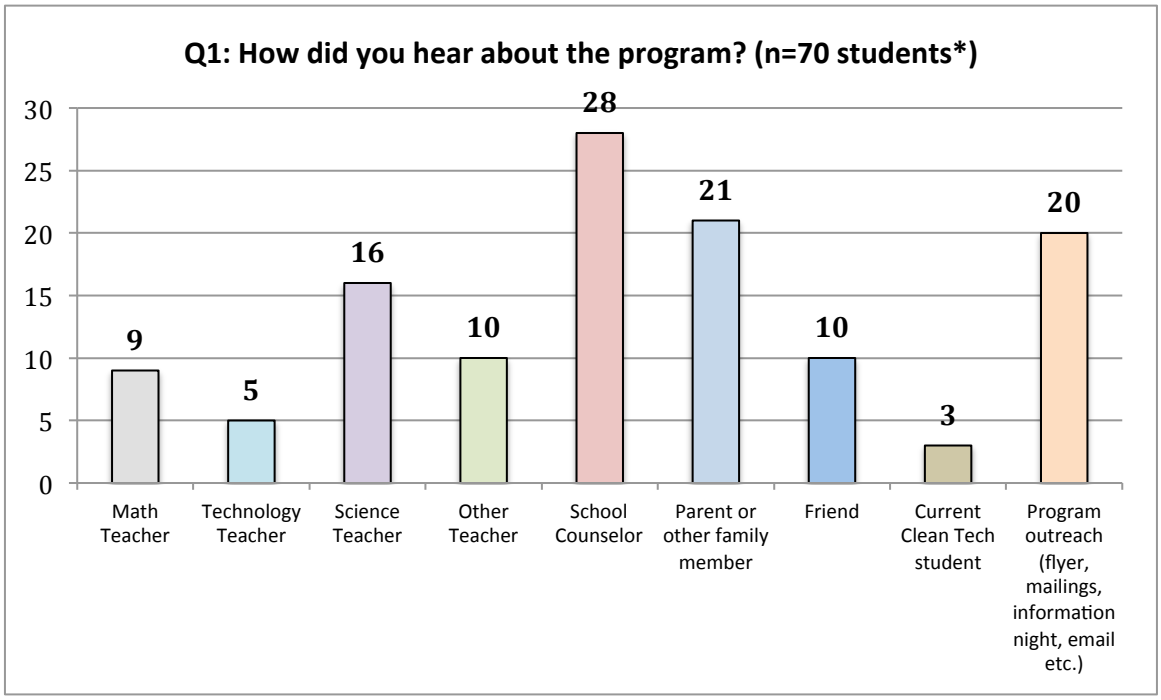
The survey design was initially developed using data gathered during prior Clean Tech student focus groups and surveys, as well as interviews conducted with the staff, students, administrators, parents and program partners. The final survey design was developed by the Knowledge Capture Team, and was also circulated for review and input from the PAST Foundation Professional Development (PD) team and the Clean Tech ECHS administrative staff. The final survey consists of (8) questions (see Appendix A).

The survey was developed to gain an understanding of student characteristics including: 1) reasons for choosing the Clean Tech ECHS Program; 2) expectations of high school, and in particular, expectations about becoming a Clean Tech student; 3) student interests; 4) ideas about college and career; and 5) prior experience with STEM informal education.

Discussion of the graphic illustration and tabled survey data is presented in the next section. Responses have been analyzed and presented graphically in bar chart format allowing comparison of student responses for "yes/no" questions, or for questions that allowed students to select among defined categories. Open-ended questions (e.g., Why did you enroll in the Clean Tech Program?) are shown in tabled format organized by themes identified in student responses. Questions 2, 6, 7, and 8 include both a bar chart and tabled data of associated responses (e.g., "If yes, please describe"). Note that a student response to an open-ended question could contain multiple themes; in that event, responses were parsed to identify each theme included by the student in their response.

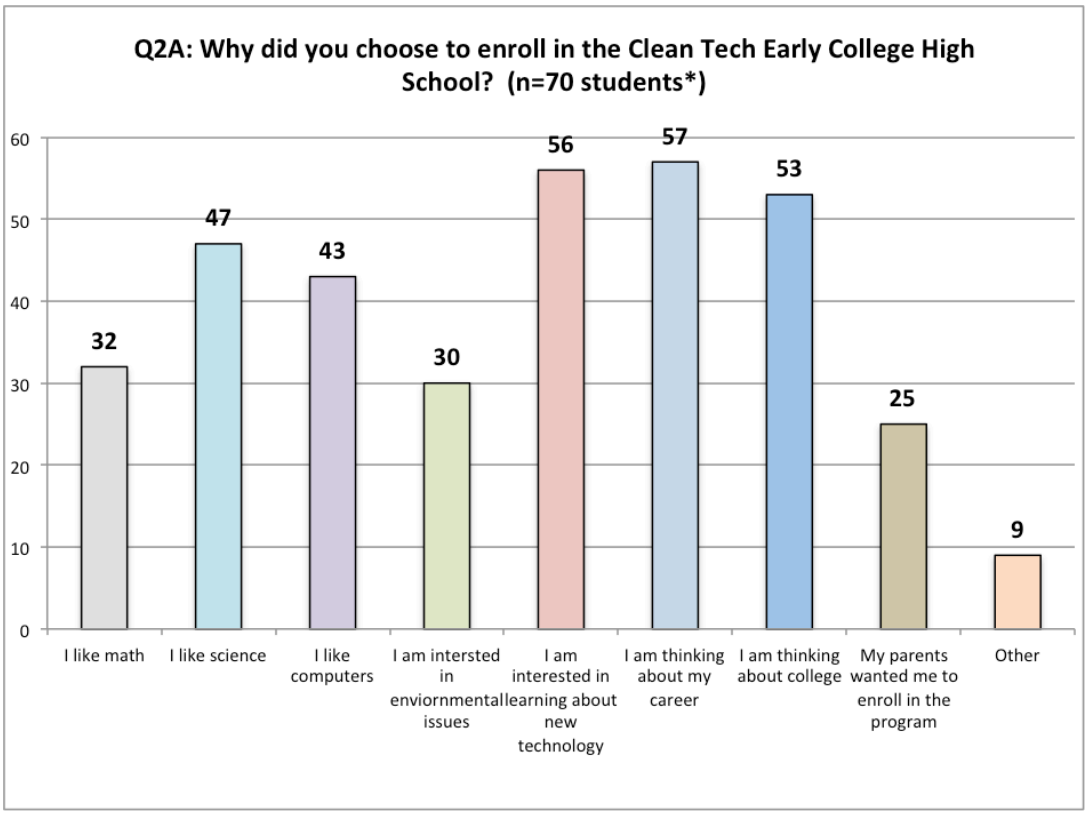
Clean Tech ECHS Student Survey Analysis

The 9th grade outreach and recruitment strategy for the Clean Tech ECHS Program employed a multi-faceted approach that directed program information to school faculty and counselors, as well as directly to families through a range of outreach activities including holding evening events for prospective students and their parents. Of the (70) students who responded to the question, 40% identified school counselors and 57% reported teachers as the source of information about the Clean Tech Program, validating an important outreach component for building interest in the program. Reaching out to parents also proved effective, with nearly one-third of students (30%) identifying a parent or family member as a source for developing student interest. The latter was considered by program staff to be an important aspect of outreach for 9th grade students, who it was thought could need more involvement of parents in making the choice to enroll in the early college program. Overall, 44% (31) of the 70 students identified more than one source of information about the Clean Tech ECHS Program (total responses = 122).



** Students could select more than one category, indicating more than one source of information about the Clean Tech ECHS Program (total responses=122).*

In response to the question, "Why did you enroll in the Clean Tech Program," students selected from among nine choices, including the option to give a written response (n=70). Students were also given the option to select more than one reason for choosing to enroll at Clean Tech. Sixty-six students (94%) identified multiple reasons for becoming a Clean Tech student. At least three-quarters of the students identified their interest in preparing for a career (81%) or in preparing for college (75%). Students also identified science (67%), math (47%), environmental issues (43%), technology (80%) or interest in computers (61%) as reasons to attend the program. Just over one-third (36%) said their parents wanted them to enroll in the program.



**Students were given the option to select more than one reason; total reasons given by students = 352.*

Q2B: Why did you enroll? (n=9*)	Number of Responses
Greater oppertunities	3
Fun and/or great experience	2
Develop public speaking skills	1
Intrest in clean energy and/or technolgoy	1
Obtain an Assosiate's degree	1
Curious about new program	1
Open new ideas for career pathways	1

Sixty-nine students responded to the open-ended question, "What was your favorite class in 8th grade?". Just over one-third of students Identified science (35%) as their favorite class, followed by math (28%) as their favorite class. Note in response to why a student liked a particular class, 35% of students identified the teacher as a factor in their choice of favorite subject. Only five students identified more than one favorite subject.

Q3A: What was your favorite class? (n=69*)	Number of Responses
Science	24
Math	19
Technology	12
Social Studies	8
English Language Arts	4
Foreign Language	3
Family and Consumer Science	2
Engineering	1
Art	1
STEM	2
Chorus	1

**Five students identified more than one class; total number of subject areas identified by students = 77.*

Q3B: Why was it your favorite class? (n=69*)	Number of Responses
Themes	
Inspiring and engaging teacher	24
Hands on learning	16
Course experience is fun	14
Proficiency in subject	13
Problem solving	7
Use of and learning about technology	6
Challenging material	4
Enjoy subject material	2
Real world learning	2
Trandisciplinary learning	1
Creative freedom	1
Improving skills	1

**Some students identified more than one idea about their favorite class; total reasons identified by students = 88.*

In response to the open-ended question, "What do you think will be the most exciting thing about your first year of high school?", the top two student responses included either more freedom in general, or more freedom to choose coursework, for a combined total of 44% of student responses (n=70). Just over one-third of students (36%) identified either the Clean Tech Program, or related program components (technology classes, college preparation, or career preparation), although only 5 students identified college preparation and 1 student said that career preparation was the most exciting aspect of high school. This is in contrast with Q2: "Why did you enroll in Clean Tech?" where at least three-quarters of the students (n=70) identified their interest in preparing for a career or in preparing for college as their reason for enrolling in the program.

Q4A: Most exciting thing about first year of High School (n=70*)	Number of Responses
Theme	
More freedom	17
Variety of classes, electives, and choices	14
Working with new teachers	13
CTECHS program	11
Working with new people	8
New technology; technology classes	8
New building and/or environment	6
Working with older students	6
College preparation	5
Seeing friends	5
New opportunities	2
Freedom to carry personal belongings to class	2
Sports and clubs	2
Maturity and responsibility	1
Group projects	1
Career preparation	1
Vacation time	1
Learning new things	1

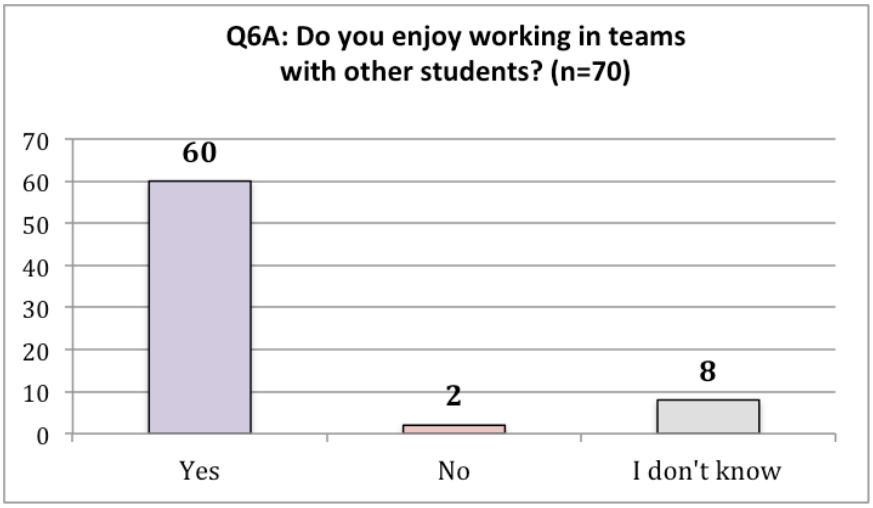
**Twenty-eight (40%) of students identified more than one idea about being a high school freshman; total ideas identified by students = 104.*

Student expectations (n=70) about the most exciting aspect of becoming a Clean Tech student shows a clear difference between their views on their home high school and the early college program, with 21% of students identifying the opportunity for early college coursework, and 13% citing working with new technology or helping the environment. Only five students included expanding career opportunities as the most exciting thing about becoming a Clean Tech student in comparison with responses to Q2, with 81% of students citing preparing for a career as the reason they chose to enroll in the Clean Tech program. Thirty-five students (50%) identified multiple ideas about becoming a Clean Tech student.

Q5A: Most exciting thing about becoming a CTECHS student (n=70*)	Number of Responses
Theme	
Meeting new people	24
Early college	15
Learning new things	11
Learning and working with new technology	9
Helping the environment	9
Learning in a new way	8
Expanding career opportunities	5
Being with engaged students who share interests	4
Other opportunities	3
Hands on projects	3
Obtaining an Associate's degree	3
STEM	3
Being challenges	2
Being an early adaptor	2
Becoming a role model	1
Gaining leadership skills	1
Working in groups	1
Gaining closer relationship with teachers	1
Becoming a better students	1
Experiencing real world learning	1
Gaining confidence	1

**Half of the students responding to this question identified multiple ideas about becoming a Clean Tech Student; total ideas included by students = 108.*

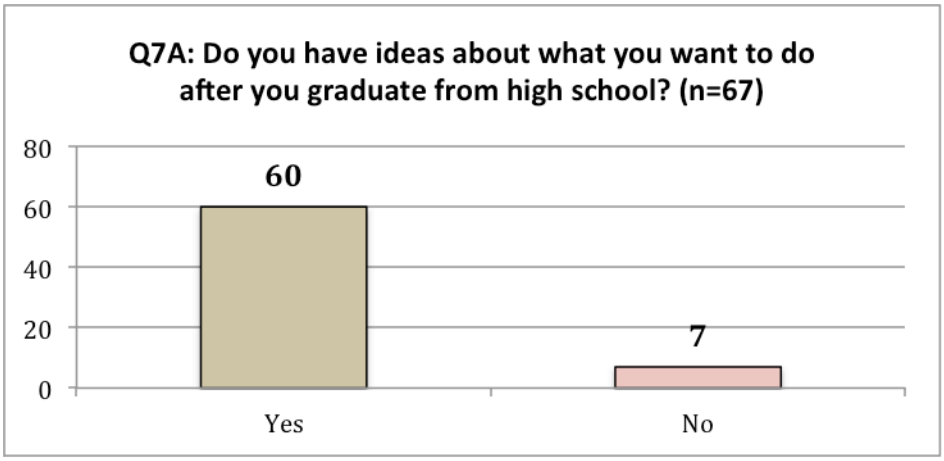
A major component of the 9th grade program will focus on building skills to support collaborative teamwork to design and complete school projects. Of the (70) students who responded to the question about teamwork, (87%) indicated that they enjoy working in teams. Fifty-three of the (60) students who said they enjoyed teamwork, also responded to the open-ended question giving reasons why they like working in teams. Students identified a range of reasons for their positive view of teamwork including sharing ideas (39%) and working together to solve problems (31%). Of the eleven themes presented in Table 6B, five are related to sharing or working together.



Q6B: What do you like about working in teams? (n=53*)	Number of Responses
Theme	
Sharing ideas	27
Solving problems together	22
Working together	8
Sharing work equally	6
Meeting new people	6
Bonding with other students	4
Sharing skills	4
Making new friends	4
Working more efficiently	3
Having fun with the experience	2
Personal growth	1

**Fifty-three students identified reasons why they like working in teams; (28) included multiple ideas about working in teams. Total ideas about working in teams given by*

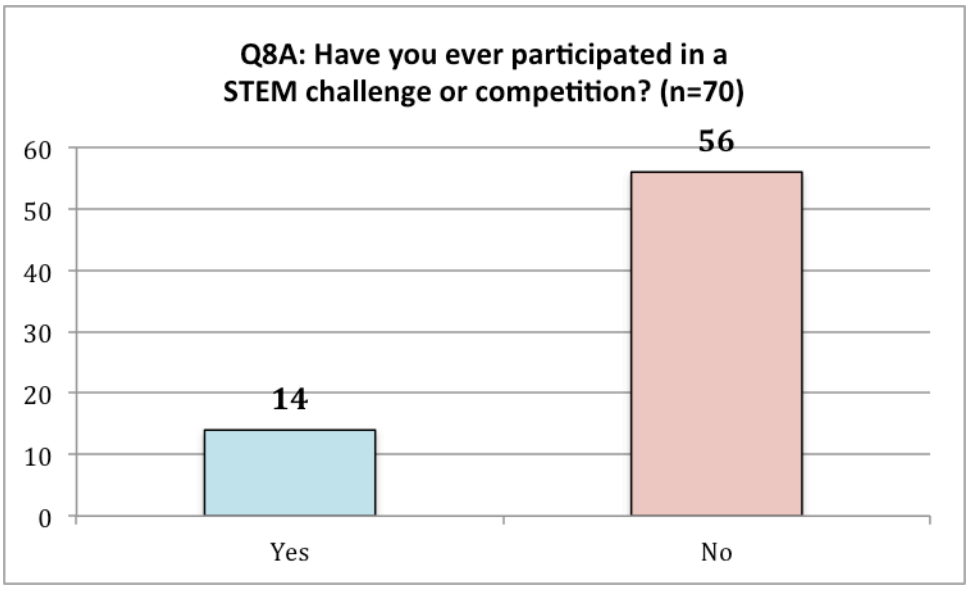
In response to the question, "Do you have ideas about what you want to do after you graduate?" (n=67), 90% replied they did. Fifty-five students identified specific career interests, and these are listed in Table 7B.



Q7B: What are your ideas for after High School? (n=55*)	Number of Responses
Themes	
College (4 Years, Bachelor's degree)	17
Engineering or design	8
Computer Science	6
Medical field	5
Business	5
Graduate school	5
Clean energy/Clean technology career	4
Veterinary science	4
Nanotechnology	4
Creative arts	4
Math/Science field	4
Technology	2
Speech pathology/Speech therapy	2
Teaching	1
Military	1
Police work	1
Sportscaster	1
Financially secure job	1

**42% of the students responded with more than one goal (e.g., I want to go to college and become a veterinarian).*

A surprising number of students (80%) indicated that they had not participated in a STEM challenge or competitive project activity prior to enrolling in the Clean Tech program. This suggests that increased outreach could potentially raise awareness and interest in STEM learning through informal activities, and help to expand the regional pool of students enrolling in the Clean Tech program in future years.



Q8B: What did you enjoy about participating in a STEM challenge? (n=11*)	Number of Responses
Theme	
Enjoyed working with peers who share their interest and/or skills	6
Specified type of competition, such as Robotics	5
Fun and enjoyable	3
Enjoyed creative problem solving	2
Enjoyed hands-on learning	1
Enjoyed solving real world problems	1

Appendix A:
CTECHS Student Survey

Clean Tech ECHS New Student Survey 2014

1. **How did you first hear about the Clean Tech Early College High School? (choose all that apply)**
   - ❑ Math teacher
   - ❑ Science teacher
   - ❑ Other teachers
   - ❑ School counselor
   - ❑ Parent or other family member
   - ❑ Friend
   - ❑ Current Clean Tech student
   - ❑ Program outreach (flyer, mailings, information night, email etc.)
   - ❑ Other
   - ❑ If other, please describe

     _____

     _____

2. **Why did you choose to enroll in the Clean Tech Early College High School? (choose all that apply)**
   - ❑ I like math
   - ❑ I like science
   - ❑ I like computers
   - ❑ I am interested in environmental issues
   - ❑ I am interested in learning about new technology
   - ❑ I am thinking about my career
   - ❑ I am thinking about college
   - ❑ My parents wanted me to enroll in the program
   - ❑ Other
   - ❑ If other, please describe

     _____

     _____

3. **What was your favorite class in 8th grade, and why?**

   _____

   _____

   _____

   _____

4. **What do you think will be the most exciting thing about your first year of high school?**

_____
_____
_____
_____

5. **What do you think will be the most exciting thing about becoming a Clean Tech Early College High School student?**

_____
_____
_____
_____

6. **Do you enjoy working in teams with other students?**
   - ❍ Yes
   - ❍ No
   - ❍ I don't know
   - ❍ If yes, what do you like about it?

_____
_____

7. **Do you have ideas about what you want to do after you graduate from high school?**
   - ❍ Yes
   - ❍ No
   - ❍ If yes, what are your ideas?

_____
_____

8. **Have you ever participated in a STEM challenge or competition?**
   - ❍ Yes
   - ❍ No
   - ❍ If yes, what did you enjoy about the experience?

_____
_____