

Teacher Reports of Student Engagement among Middle School Students with Disabilities Participating in the Tech Success Program

University of Oklahoma E-TEAM

The Tech Success evaluation predicts that middle school students who participate in the program will become increasingly engaged in classroom tasks following exposure to the program's afterschool activities, field trips, and institutes that focus on science, technology, engineering, and mathematics (STEM) fields. The evaluation uses a teacher report scale developed by Skinner & Belmont¹ (1993), which asks teachers to assess their students' willingness to participate in school tasks (i.e., effort, attention, and persistence during the initiation and execution of learning activities), as well as their emotional reactions to these tasks (i.e., interest versus boredom, enjoyment versus anxiety). The *Teacher Report of Student Engagement* focuses on cognitive, behavioral, and affective indicators of student engagement in learning tasks. According to Skinner and Belmont,

Children who are engaged show sustained behavioral involvement in learning activities accompanied by a positive emotional tone. They select tasks at the border of their competencies, initiate action when given the opportunity, and exert intense effort and concentration in the implementation of learning tasks; they show generally positive emotions during ongoing action, including enthusiasm, optimism, curiosity, and interest.

The opposite of engagement is disaffection.

Disaffected children are passive, do not try hard, and give up easily in the face of challenges [they can] be bored, depressed, anxious, or even angry about their presence in the classroom; they can be withdrawn from learning opportunities or even rebellious towards teachers and classmates. (p. 572.)

The instrument includes seventeen statements describing observable behavior and attitudes toward classroom tasks. Four tech success teachers were asked to rate forty students according to whether each behavior is "very characteristics," "somewhat characteristics," "not very characteristic" or "not at all characteristics of this student." Table 1 shows the average ratings on a scale of 1 to 4, of each behavior or attitude by length of time student has participated in the program. For twelve of the seventeen items, students were rated as more engaged when they were observed after participating in Tech Success for seven months or longer. These observations were made during an eighteen month period from May of 2006 and October of 2007. Forty observations were made of students ranging from 6th to 9th grade. Only one observation (the first) was included per student for the present analysis.

¹ Skinner, E.A., & Belmont, M.J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85(4): 571-581.

Table 1: Average Ratings of Teacher Observation by Length of Time in Program

Teacher Report of Student Engagement (Scale range from 1 = “not at all characteristic” to 4 = “very characteristic of this student.”)	Time in Program 2 to 6 Months		Time in Program 7 Months or More		Mean Difference
	Average Rating	Standard Deviation	Average Rating	Standard Deviation	
1. This student likes to figure out things for himself.	2.75	0.91	2.95	0.95	+ .20
2. In my class, this student pays attention only to topics or activities that interest her (to more than just topics that interest her).*	2.00	0.92	2.50	0.95	+ .50**
3. This student is creative.	2.95	0.89	3.05	0.60	+ .10
4. When this student is faced with a difficult problem or question in my class, he seems to enjoy the challenge.	2.25	0.79	2.40	.88	+ .15
5. In my class, this student appears (does not appear) anxious.*	3.15	.93	3.20	.70	+ .05
6. This student works only as hard as (harder than) necessary to get by.*	2.45	.89	2.50	.95	+ .05
7. This student isn't very (is) creative when it comes to schoolwork.*	2.50	.95	2.90	.55	+ .40**
8. This student concentrates on doing his/her work in my class.	3.00	.80	2.95	1.00	- .05
9. When it comes to doing classroom assignments, this student doesn't (does) think for herself.*	2.70	.73	2.55	.89	- .05
10. This student does the best he can in school.	3.10	.91	3.15	.88	+ .05
11. In my class, this student appears (does not appear) depressed.*	3.85	.37	3.35	.67	- .50
12. This student prefers doing schoolwork that is easy (challenging) for her.*	1.95	.83	1.80	.83	- .15
13. This student comes up with unique ways to do school assignments.	2.10	.85	2.40	.60	+ .30**
14. This student prefers assignments which he already knows (does not already know) how to do.*	1.85	.81	1.90	.55	+ .05
15. This student does more than is required of her.	2.10	1.12	2.60	1.10	+ .50**
16. This student doesn't like (likes) to figure out anything for himself.*	2.60	.94	2.65	.67	+ .05
17. This student works hard in my class.	3.25	.79	3.15	.88	- .10

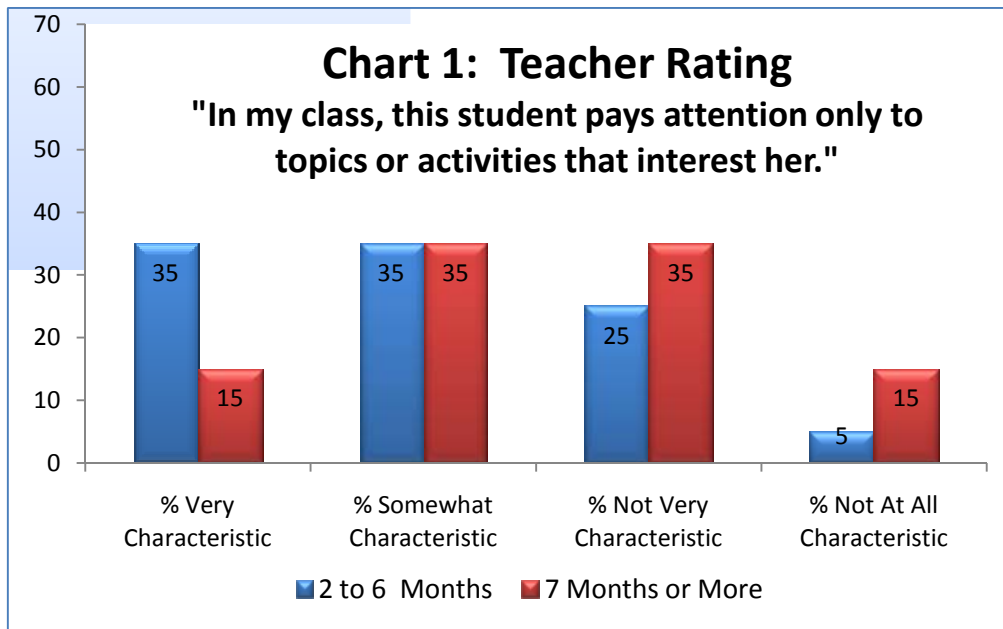
*The scoring scale for items 2, 5, 7, 9, 11, 12, 14, and 16 was reversed. The reversed form of the question is in parenthesis.

**Difference is statistically significant at the .05 level or better.

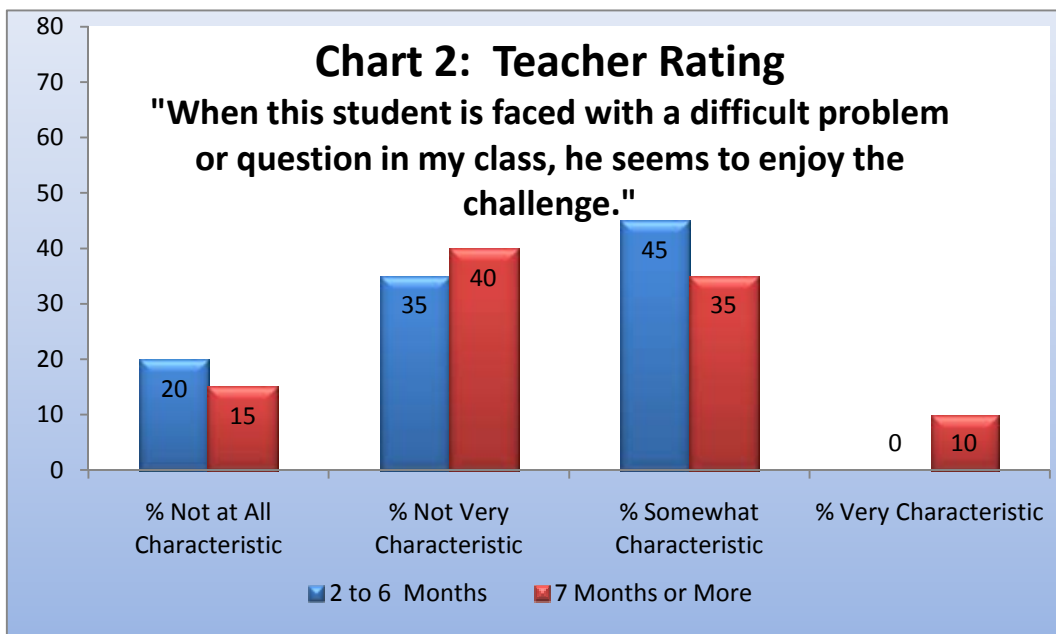
Four observation items were rated significantly higher (at .05 or better) for students participating in Tech Success seven months or longer. These four items, shown in Charts 1 through 4, are: (1) *In my class, this student pays attention only to topics or activities that interest her*; (2) *This student isn't very creative when it comes to schoolwork*; (3) *This student comes up with unique ways to do school assignments*; and (4) *This student does more than is required of her*.

Chart 1 shows that, in the early months of Tech Success, 70% of the students were observed to “pay attention only to topics or activities that interested them” (i.e., were NOT engaged). Only 5% of the students observed did not exhibit this behavior (i.e., WERE engaged). Fewer of the students observed in the later months of the projects demonstrated low engagement as

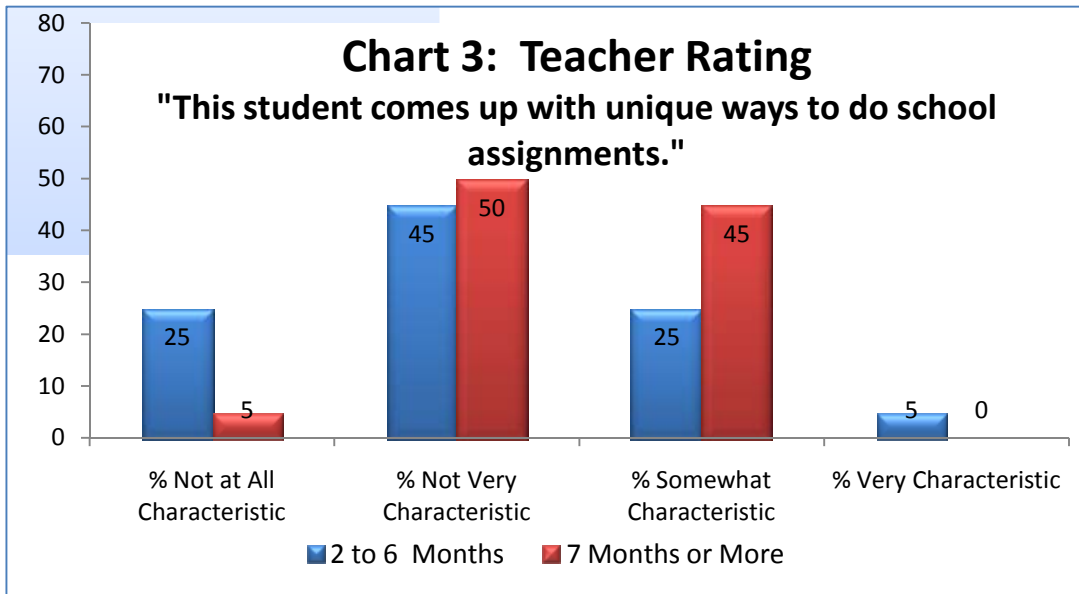
measured by this variable—only 15% were rated as “very characteristic” compared to 35% of students observed in the early months of the project.



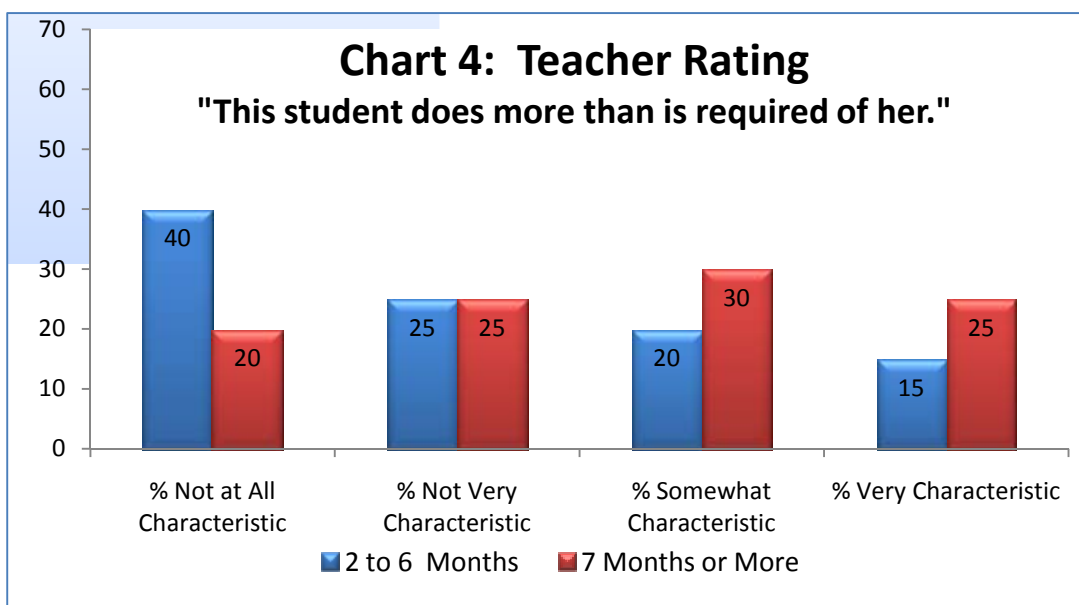
The second indicator of student engagement observed significantly more often among students in Tech Success 7 months or more was the degree to which students seemed to enjoy a challenge. Ten percent of the longer term students were in the “very characteristic” category compared to 0% in the early months of the project.



The third indicator of student engagement (Chart 3) that was observed more often among students in the project 7 months or more was a measure of creativity in school assignments. Twenty-five percent of the students observed in the first six months of the project did NOT exhibit this behavior compared to only 5% after 7 months.



The fourth indicator, represented in Chart 4, shows a significant difference in motivation among students observed early in the project (40% NOT at all characteristic) compared to 15% at “very characteristic” in the first six months of the project. After 7 months in the project, students are observed to have greater motivation and initiative, as measured by doing more than is required of him or her, while fewer (20%) fall into the “NOT at all characteristic” category.



In addition to the items showing statistically significant higher engagement among longer-term participants in Tech Success, increases were observed on three items that were greater than 5% but less than statistically significant. These are: (1) *This student likes to figure out things for himself*; (2) *This student is creative*; and (3) *When this student is faced with a difficult problem or question in my class, he seems to enjoy the challenge*. In other words, students who have been in the project more than 6 months are more likely to be observed by teachers as liking “to figure things out” for him/herself, more likely to demonstrate creativity, and more likely to exhibit behaviors that indicate s/he enjoys the challenge of problem-solving.

Three observable behaviors were inversely related to the length of time students participated in the project. The first of these, *In my class, this student appears (does not appear) depressed*, is the only emotion indicator with an average rating difference greater than a 5% between the two groups. Teachers observed this behavior more often among students who were in Tech Success more than 6 months. The second indicator, *This student prefers doing schoolwork that is easy (challenging) for her*,” is a specific classroom behavior observed more frequently among students who were in the project more than 6 months. The third indicator, *This student works hard in my class* was observed more frequently among students in the early months of participation.

Table 2: Average Ratings of Teacher Observation by Type of Teacher Providing Rating

Teacher Report of Student Engagement (Scale range from 1 = “not at all characteristic” to 5 = “very characteristic of this student.”)	Rater as TS Teacher ONLY		Rater as TS and Classroom Teacher		Mean Difference
	Average Rating	Standard Deviation	Average Rating	Standard Deviation	
1. This student likes to figure out things for himself.	2.42	.96	3.24	.70	+.82*
2. In my class, this student pays attention only to topics or activities that interest him/her (to more than just topics that interest her).*	2.05	.91	2.43	.98	+.38
3. This student is creative.	2.74	.87	3.24	.54	+.50*
4. When this student is faced with a difficult problem or question in my class, he seems to enjoy the challenge.	2.00	.88	2.62	.67	+.62*
5. In my class, this student appears (does not appear) anxious.*	3.42	.90	2.95	.67	-.47*
6. This student works only as hard as (harder than) necessary to get by.*	2.26	.93	2.67	.86	+.41
7. This student isn't very (is) creative when it comes to schoolwork.*	2.37	.90	3.00	.55	+.63*
8. This student concentrates on doing his/her work in my class.	2.84	.77	3.10	1.00	+.26
9. When it comes to doing classroom assignments, this student doesn't (does) think for herself.*	2.42	.84	2.81	.75	+.39
10. This student does the best he can in school.	3.00	.82	3.24	.94	+.24
11. In my class, this student appears (does not appear) depressed.*	3.79	.42	3.43	.68	-.36*
12. This student prefers doing schoolwork that is easy (challenging) for her.*	1.84	.90	1.90	.77	+.06

Teacher Report of Student Engagement (Scale range from 1 = "not at all characteristic" to 5 = "very characteristic of this student.")	Rater as TS Teacher ONLY		Rater as TS and Classroom Teacher		Mean Difference
	Average Rating	Standard Deviation	Average Rating	Standard Deviation	
13. This student comes up with unique ways to do school assignments.	1.89	.81	2.57	.51	+ .68*
14. This student prefers assignments which he already knows (does not already know) how to do.*	1.79	.86	1.95	.50	+ .16
15. This student does more than is required of her.	2.05	1.22	2.62	.97	+ .57*
16. This student doesn't like (likes) to figure out anything for himself.*	2.42	.96	2.81	.60	+ .39
17. This student works hard in my class.	3.05	.85	3.33	.80	+ .28

The teacher report of student engagement is intended to measure teacher perceptions of how engaged students are in classroom tasks. The observation forms were completed by Tech Success teachers who work with students approximately 90 minutes per week. However, teachers vary in the extent of instructional interaction they have with the students participating in the program. For instance, two teachers have students in their regular science classrooms. One teacher has several students in her special education classroom for most of the regular school day. Another teacher spends her daytime hours in a different school building altogether with little or no contact with Tech Success students outside the weekly sessions and field events. Still other teachers have intermittent, non-instructional contact with Tech Success students during the regular school day, such as during cafeteria duty or morning hall monitoring.

While teachers were instructed to report on their observations of a particular student during Tech Success time, it is reasonable that teachers who see individual students more frequently than the 90 minute weekly session will have a different understanding of those students' performance and classroom related behavior than teachers who have the more limited, program-related contact. In fact, teachers who spend regular classroom time with participating students tended to rate student engagement higher than teachers who spent less time with their students (Table 2).

On fifteen of the seventeen observable indicators of classroom engagement, teachers who had more frequent interaction with tech success students tended to rate them as more engaged than teachers whose interactions (therefore observations) were limited to Tech Success activities. The differences for six of these 13 indicators were statistically significant at the $p < .05$ level. These indicator/behaviors are: (1) *This student likes to figure out things for himself*; (2) *This student is creative*; (3) *When this student is faced with a difficult problem or question in my class, he seems to enjoy the challenge*; (4) *This student isn't (reversed) very creative when it comes to schoolwork*; (5) *This student comes up with unique ways to do school assignments*; and (6) *This student does more than is required of her*.

One indicator was rated significantly higher for one gender (females) than the other: *This student concentrates on doing his/her work in my class*. Table 3 shows the gender comparison for all observations of engagement.

Table 3: Average Ratings of Teacher Observation by Student Gender

Teacher Report of Student Engagement (Scale range from 1 = "not at all characteristic" to 5 = "very characteristic of this student.")	Male Students (n=25)		Female Students (n=15)		Mean Difference
	Average Rating	Standard Deviation	Average Rating	Standard Deviation	
1. This student likes to figure out things for himself.	2.92	.91	2.73	.96	.19
2. In my class, this student pays attention only to topics or activities that interest him/her (to more than just topics that interest her).*	2.12	1.09	2.47	.64	.35
3. This student is creative.	3.12	.73	2.80	.78	.32
4. When this student is faced with a difficult problem or question in my class, he seems to enjoy the challenge.	2.44	.87	2.13	.74	.31
5. In my class, this student appears (does not appear) anxious.*	3.16	.85	3.20	.78	.04
6. This student works only as hard as (harder than) necessary to get by.*	2.52	.96	2.40	.83	.12
7. This student isn't very (is) creative when it comes to schoolwork.*	2.80	.87	2.53	.64	.27
8. This student concentrates on doing his/her work in my class.	2.72	.89	3.40	.74	.68*
9. When it comes to doing classroom assignments, this student doesn't (does) think for herself.*	2.56	.82	2.73	.80	.17
10. This student does the best he can in school.	3.04	.89	3.27	.88	.23
11. In my class, this student appears (does not appear) depressed.*	3.68	.48	3.47	.74	.21
12. This student prefers doing schoolwork that is easy (challenging) for her.*	1.92	.81	1.80	.86	.12
13. This student comes up with unique ways to do school assignments.	2.20	.76	2.33	.72	.13
14. This student prefers assignments which he already knows (does not already know) how to do.*	1.84	.69	1.93	.70	.09
15. This student does more than is required of her.	2.32	1.11	2.40	1.18	.08
16. This student doesn't like (likes) to figure out anything for himself.*	2.64	.86	2.60	.74	.04
17. This student works hard in my class.	3.12	.83	3.33	.82	.21

Summary

The Teacher Report of Student Engagement Questionnaire asks teachers to make and record observations using two broad categories of indicators: their students' willingness to participate in school tasks (i.e., effort, attention, and persistence during the initiation and execution of learning activities); and their emotional reactions to these tasks (i.e., interest versus boredom, enjoyment versus anxiety). Mean Observation ratings were compared by three independent variables: length of time in program at observation, level of interaction with the observing teacher, and gender. While this by no means exhausts the potential correlates for the observed behavior, it represents a sampling of factors that reasonably might affect those outcomes.