



**Instructors**

**LET'S GO STEM Program**

**2013-2014**

**LET'S GO INSTRUCTOR REPORT**

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Based on the data collected through surveygizmo, there were 59 instructors for LET'S GO STEM activities during the school year 2013-14. These instructors came from 10 sites and identified their roles as instructors, facilitators, coaches and mentors. Fifty five or 93.22% responded to the pre-program survey while only 35 responded to the post-program survey. Only about half of the instructors had matching pre- and post-program surveys (N=31 or 52.54%), the data from which were used for analyzing whether there were significant differences in teachers' beliefs about teaching STEM and the confidence in their own abilities to teach STEM after their participation as LET'S GO instructors.

**Table 1. Response Rates**

School	Number of Instructors	Pre	Post	with Matching Data
Bates	2	2	1	1
BGCMB	8	7	4	3
Callaway	5	3	5	3
CAPCS	8	8	0	0
Eagle	10	10	2	2
Elev8	3	3	3	3
Higher Achievement	3	3	3	3
Meade Schools	15	14	14	13
Mt Royal	2	2	1	1
Westport	2	2	2	2
Name of site not provided	1	1	0	0
<b>Total</b>	<b>59</b>	<b>55</b>	<b>35</b>	<b>31</b>
<b>% Response Rate</b>		<b>93.22%</b>	<b>59.32%</b>	<b>52.54%</b>

The following table shows the results of the mean comparison using data from Teacher Belief/Confidence Survey administered to the instructors at the beginning and toward the end of the program. Thirty one instructors completed both pre- and post-program instructor surveys. The analyses using dependent t-tests reveal that participation in the LET'S GO STEM programs as instructors significantly influence the instructors' confidence in their ability to teach STEM.





**Table 2. Pre- and Post-Program Mean Comparisons**

ITEMS	t	df	Sig. (2-tailed)
1 When a student does better than usual in STEM, it is often because the teacher exerted a little extra effort	0.373	30	0.712
2 I am continually finding better ways to teach STEM	1.763	30	0.088
3 Even when I try very hard, I don't teach STEM as well as I do most subjects	-2.971	30	0.006
4 When the STEM grades of students improve, it is most often due to their teacher having found a more effective teaching approach	0.528	30	0.601
5 I know the steps necessary to teach STEM concepts effectively	1.944	28	0.062
6 I am not very effective in monitoring experiments	-1.545	30	0.133
7 If students are underachieving in STEM, it is most likely due to ineffective STEM teaching	-1.278	30	0.211
8 I generally teach STEM ineffectively	-2.882	30	0.007
9 The inadequacy of a student's STEM background can be overcome by good teaching	0	30	1
10 The low STEM achievement of some students cannot generally be blamed on their teachers	0.226	30	0.823
11 When a low achieving child progresses in STEM, it is usually due to extra attention given by the teacher	0.197	30	0.845
12 I understand STEM concepts well enough to be effective in teaching elementary STEM	3.084	29	0.004
13 Increased effort in STEM teaching produces little change in some students' STEM achievement	-0.414	30	0.682
14 The teacher is generally responsible for the achievement of students	0.162	30	0.873
15 Students' achievement in STEM is directly related to their teacher's effectiveness in STEM teaching	0.387	30	0.702
16 If parents comment that their child is showing more interest in STEM at school, it is probably due to the performance of the child's teacher	0	30	1
17 I find it difficult to explain to students why experiments work	-2.53	30	0.017
18 I am typically able to answer students' STEM questions	0.722	30	0.476
19 I wonder if I have the necessary skills to teach STEM	-4.768	30	0



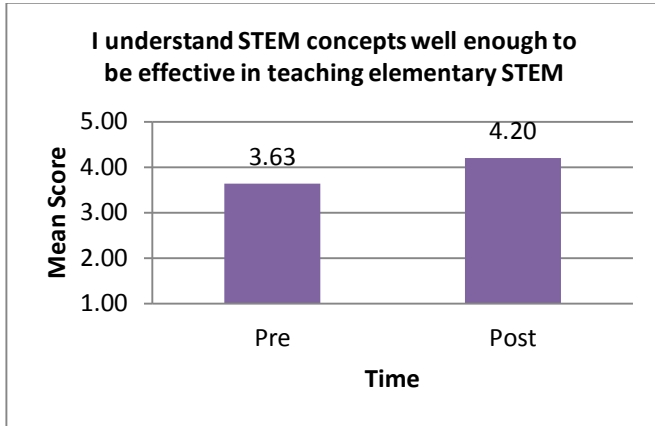


ITEMS	t	df	Sig. (2-tailed)
20 Effectiveness in STEM teaching has little influence on the achievement of students with low motivation	-0.138	30	0.891
21 Given a choice, I would not invite the principal to evaluate my STEM teaching	-0.273	30	0.787
22 When a student has difficulty understanding a STEM concept, I am usually at a loss as to how to help the student understand it better	-3.719	30	0.001
23 When teaching STEM, I usually welcome student questions	2.476	30	0.019
24 I don't know what to do to turn students on to STEM	-2.97	30	0.006
25 Even teachers with good STEM teaching abilities cannot help some kids learn STEM	-0.338	30	0.738

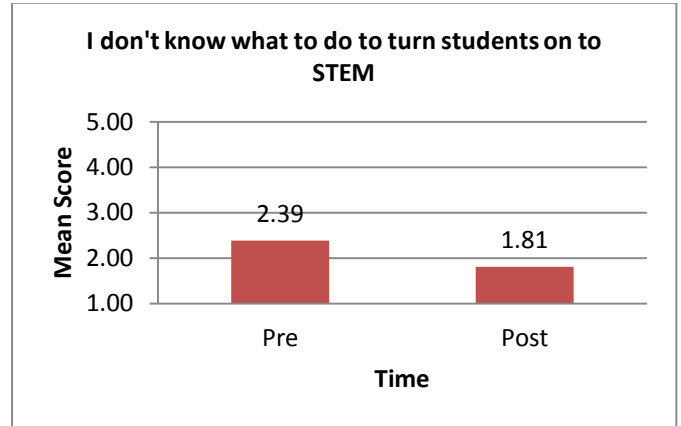
The following graphs show the areas where there are significant changes. Three of these items were stated positively while 5 items were negatively stated. All of these mean comparison show significant results, i.e. that teacher participation in LET'S GO STEM program activities are beneficial in increasing confidence of instructors in handling STEM subjects and dealing with STEM students.



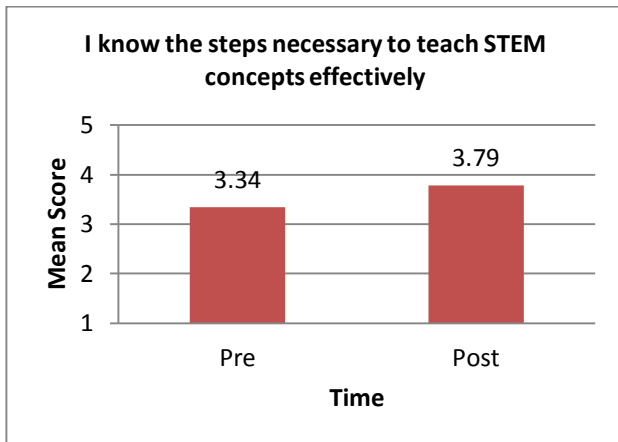
Figure 1.



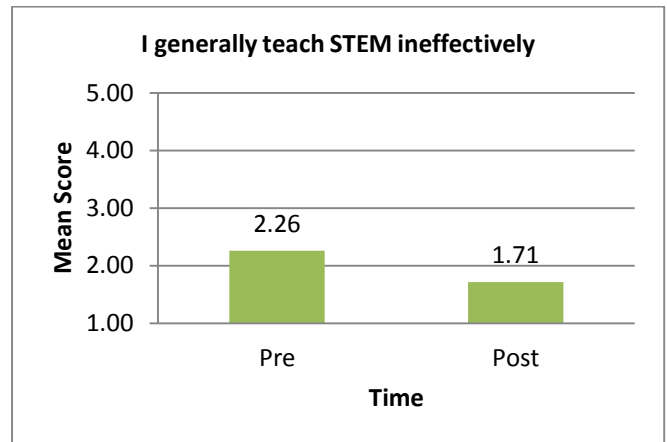
$t(29) = 3.08, p < .01$



$t(30) = -2.97, p < .01$

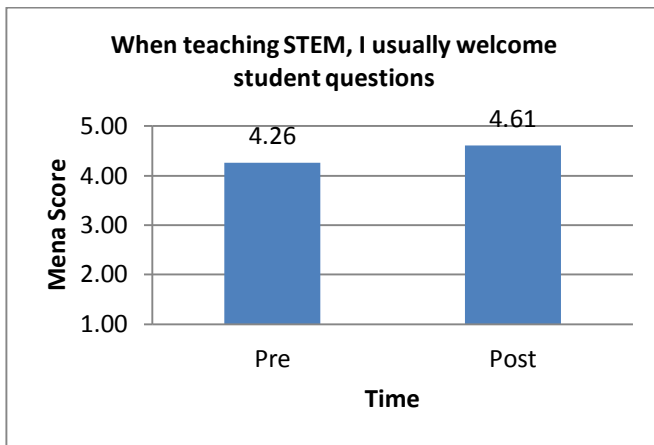


$t(28) = 1.94, p = .06$

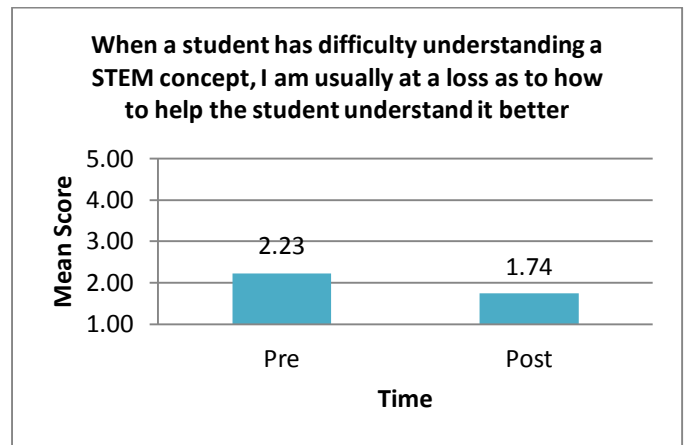


$t(30) = -2.88, p < .01$

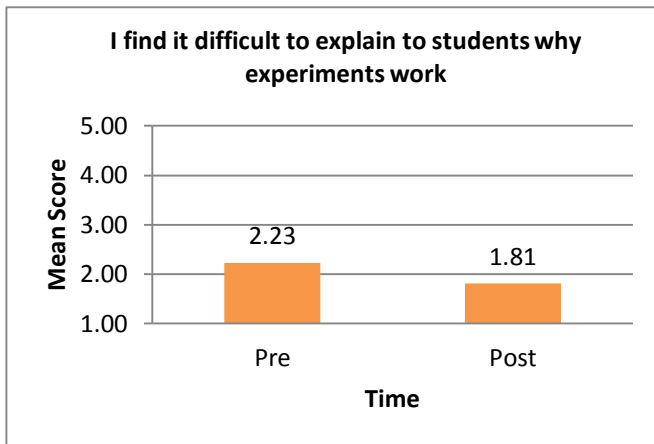




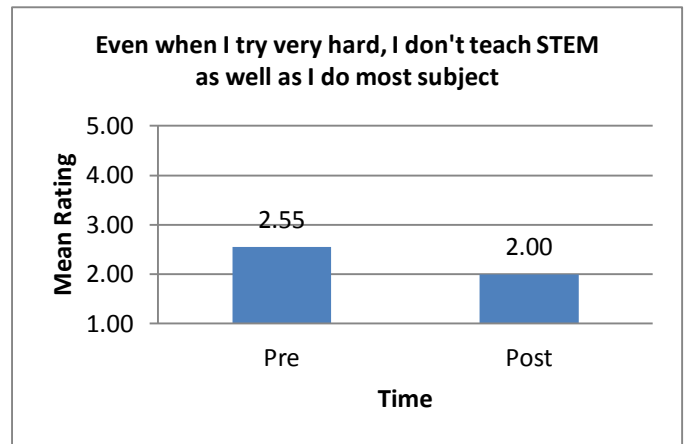
$t(30) = 2.48, p < .05$



$t(30) = -3.72, p = .001$



$t(30) = -2.53, p < .05$

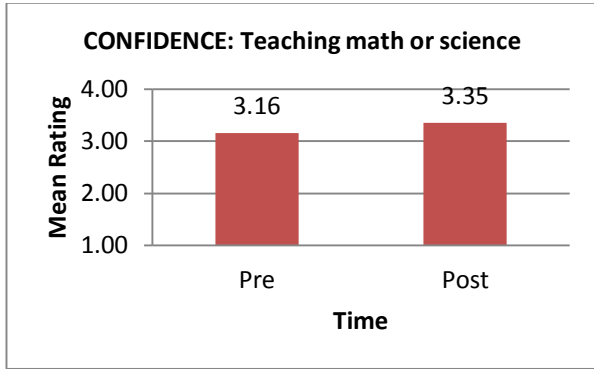


$t(30) = -2.97, p < .01$

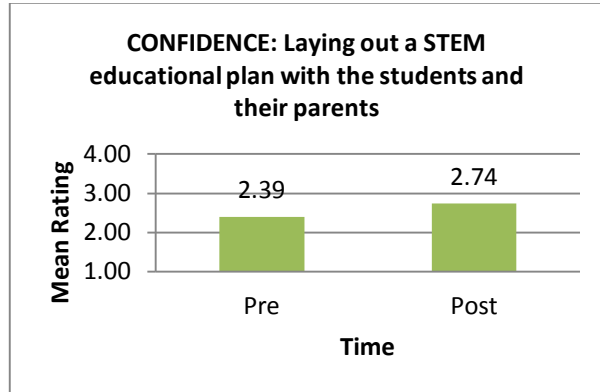
Additional analyses were done to find out influences of participation among instructors. A question that asked whether the instructors are more confident in teaching math or science garnered higher scores for the post-survey but the mean score was not significantly different from the pre-survey mean score. On the other hand, the teachers were significantly more confident in laying out a STEM educational plan with the students and their parents, and they were also more confident in explaining opportunities for STEM professionals to students.



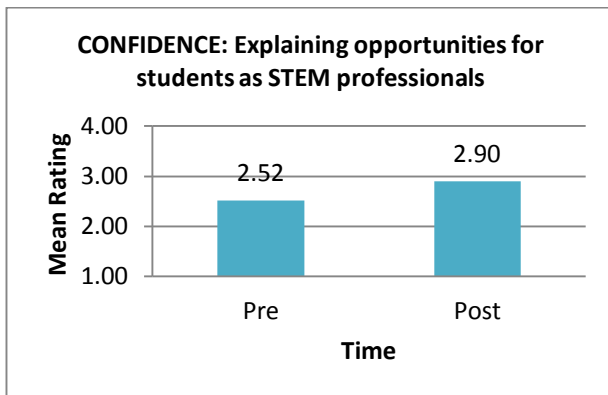
Figure 2.



$t(30) = 1.53, p = .14$  (not significant)



$t(30) = 2.79, p < .01$



$t(30) = 2.44, p < .05$





**APPENDIX.**

The chart below illustrates the result of Exploratory Factor Analysis. Factor analysis shows which items in a given pool of statements form part of a factor that represents a common construct. It is interesting to note that five of the 8 items that had significant findings form part of a single factor. This implies that these items can reliably be used to measure the influence of LET'S GO style STEM teaching among instructors.

	1	2	3	4	5	6	7	Sig.
A12 I understand STEM concepts well enough to be effective in teaching elementary STEM	0.774	0.145	0.041	-0.448	0.155	-0.005	0.141	*
A22 When a student has difficulty understanding a STEM concept, I am usually at a loss as to how to help the student understand it better	0.704	0.322	0.113	0.074	0.076	-0.069	-0.016	*
A23 When teaching STEM, I usually welcome student questions	0.73	0.256	0.003	-0.213	-0.267	0.08	-0.122	*
A3 Even when I try very hard, I don't teach STEM as well as I do most subjects	0.602	0.148	0.037	0.451	0.339	-0.269	0.032	*
A8 I generally teach STEM ineffectively	0.703	0.115	0.142	0.048	0.027	-0.035	0.201	*
B1 When a student does better than usual in STEM, it is often because the teacher exerted a little extra effort	0.237	0.768	0.191	-0.086	0.329	-0.02	0.055	
B11 When a low achieving child progresses in STEM, it is usually due to extra attention given by the teacher	0.007	0.686	0.051	-0.02	-0.124	0.475	0.103	
B4 When the STEM grades of students improve, it is most often due to their teacher having found a more effective teaching approach	0.061	0.854	0.072	-0.194	-0.056	0.193	0.034	
C15 Students' achievement in STEM is directly related to their teacher's effectiveness in STEM teaching	0.143	0.255	0.773	-0.063	-0.102	0.263	-0.378	
C25 Even teachers with good STEM teaching abilities cannot help some kids learn STEM	-0.07	0.297	0.809	0.087	0.111	-0.169	0.084	
C7 If students are underachieving in STEM, it is most likely due to ineffective STEM teaching	0.204	0.36	0.658	0.089	-0.322	-0.106	-0.176	
D18 I am typically able to answer students' STEM questions	0.067	0.104	0.253	-0.609	0.25	0.072	-0.072	
D5 I know the steps necessary to teach STEM concepts effectively	0.461	0.272	0.099	-0.623	-0.117	-0.008	-0.164	
D6 I am not very effective in monitoring experiments	0.191	0.015	0.213	0.801	0.232	-0.016	0.009	
E20 Effectiveness in STEM teaching has little influence on the achievement of students with low motivation	0.012	0.022	0.159	0.248	0.723	-0.01	0.151	
E9 The inadequacy of a student's STEM background can be overcome by good teaching	0.343	0.01	0.381	0.147	-0.633	-0.042	0.023	
F14 The teacher is generally responsible for the achievement of students	0.176	0.199	0.318	0.184	0.008	0.712	0.089	







	1	2	3	4	5	6	7	Sig.
F16 If parents comment that their child is showing more interest in STEM at school, it is probably due to the performance of the child's teacher	0.202	0.282	0.178	-0.09	0.005	0.651	-0.398	
F2 I am continually finding better ways to teach STEM	0.378	0.034	0.035	-0.313	0.124	0.611	0.167	
G21 Given a choice, I would not invite the principal to evaluate my STEM teaching	0.092	0.124	0.223	0.048	-0.002	0.136	0.777	

