

STEM Project Internal Evaluation April 2nd, 2010

1. Completed Research Report
 - I. STEM Center Usage Report – Winter 2010 (P. 2 - 3)
 - II. Math Success Center Usage Report – Winter 2010 (P. 4 - 5)
 - III. Online Tutoring Survey Analysis (P. 6 - 17)
 - IV. Calculus Readiness Workshops Math 151, Winter 2010 (P. 18 - 21)
 - V. Focus-on-Calculus Peer Mentoring Program Math 151 & 175, Winter 2010 (P. 22 - 24)
 - VI. Success and Retention Rates for Math 151 & 175 Courses, Summer and Winter Sessions (P. 25 – 29)
2. Topic for discussion
 - I. Analysis of Course Passing Rates in Math Courses - Jeff
3. Future Meeting Schedules:
 - I. May 7th. 11:00 am – Room CI237
 - II. June 4th. 11:00 am – Room AD206

MA 130 STEM Success Center Usage Report Winter 2010

Total Number of visits: 82

Total Number of students who visited the Center: 59

Table 1. Aggregated Usage Frequency Table for STEM Success Center in Winter 2010 Semester

	Average/Mean	Median	Minimum	Maximum
Winter 2010 (Jan 4th – Feb 11th)	1 hr + 34 mins	1 hr + 5 mins	1 min	9 hrs + 14 mins

Table 2. Aggregated Usage Breakouts for STEM Success Center in Winter 2010 Semester

	< 1 hour	1 to 2 hrs	2 to 3 hrs	3 to 4 hrs	4 to 5 hrs	5 to 6 hrs	6 to 7 hrs	7+ hrs	Total Students
Winter 2010 (Jan 4th – Feb 11th)	20 (33.9%)	30 (50.8%)	2 (3.4%)	2 (3.4%)	3 (5.1%)	1 (1.7%)	0 (0.0%)	1 (1.7%)	59

Table 3. Frequency of Usages

Frequency	Students
Once	47
Twice	7
Three Times	3
Four Times	1
Eight Times	1

Notes:

1. In Winter 2010 semester, there are 11.0% usages in which students did not log out (N=9 out of 82). Thus, the minutes of these usages were replaced by the median of all the usages (minutes=61).
2. In CI-Tracker, LocationID is MA130 and CategoryName is STEM Success Center, General_Course_work, and Math Success Center Tutoring. In the Winter 2010 semester, all students were logged in with “General_Course_Work” as the CategoryName.

MA 127 Math Success Center Usage Report Winter 2010

Table 1. Aggregated Usage Frequency Table for Math Success Center in Winter 2009 and Winter 2010 Sessions

	Average/Mean	Median	Minimum	Maximum
Winter 09 (Jan 20th – Feb 12th)	2 hrs + 57 mins	1 hr + 35 mins	2 mins	18 hrs + 13 mins
Winter 10 (Jan 4th – Feb 11th)	5 hrs + 53 mins	2 hrs + 0 min	5 mins	50 hrs + 44 mins

Table 2. Aggregated Usage Breakouts for Math Success Center in Winter 2009 and Winter 2010 Semesters

	< 1 hour	1 to 3 hrs	3 to 6 hrs	6 to 10 hrs	10 to 20 hrs	20 to 40 hrs	40 to 80 hrs	Total Students
Winter 09 (Jan 20th – Feb 12th)	37 (31.1%)	47 (39.5%)	19 (16.0%)	10 (8.4%)	6 (5.0%)	0	0	119
Winter 10 (Jan 4th – Feb 11th)	13 (19.1%)	28 (41.2%)	6 (8.8%)	5 (7.4%)	13 (19.1%)	2 (2.9%)	1 (1.5%)	68

Notes:

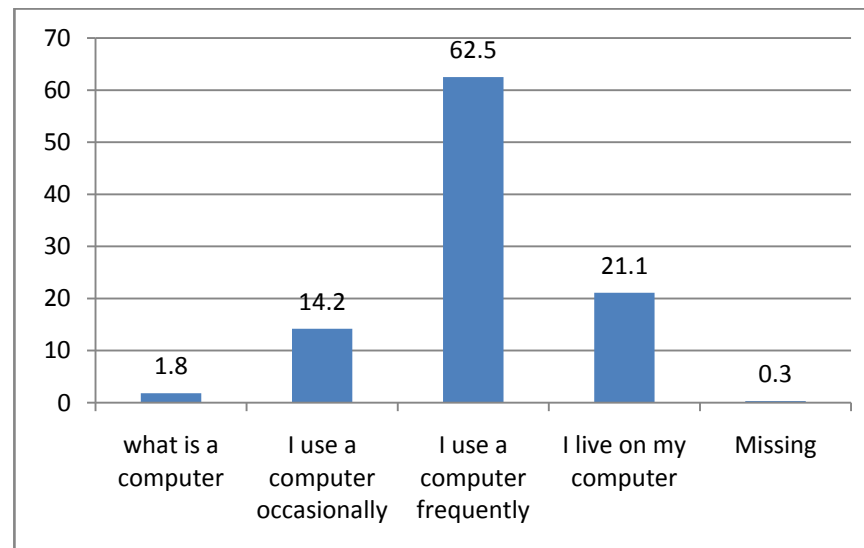
1. In Winter 09 semester, there are 2.8% usages in which students did not log out (N=10 out of 353). Thus, the minutes of these usages were replaced by the median of all the usages (minutes=48).
2. In Winter 2010 semester, there are 1.8% usages in which students did not log out (N=5 out of 276). Thus, the minutes of these usages were replaced by the median of all the usages (minutes=71).

Student Survey – Online Tutoring

All Respondents (N=331):

1. How comfortable are you with technology – select the answer that best describes you:

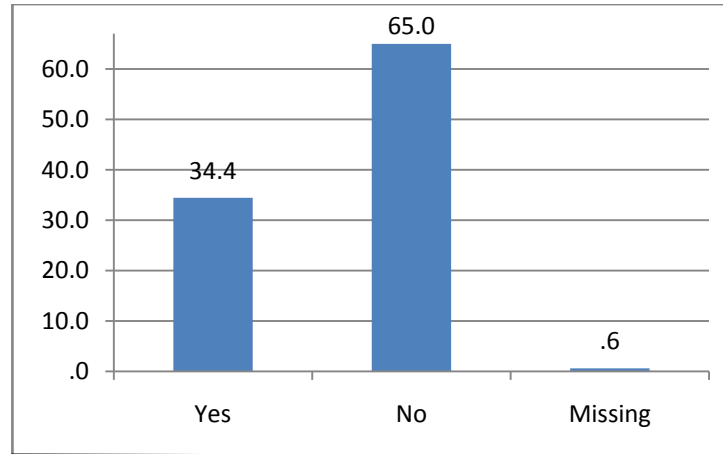
	Frequency	Percent
What is a computer	6	1.8
I use a computer occasionally	47	14.2
I use a computer frequently	207	62.5
I live on my computer	70	21.1
Missing	1	.3
Total	331	100.0



The majority of the students who responded to the survey use a computer either frequently or very frequently.

2. I have and use an online camera and head phones for video conferencing (ex: skype)

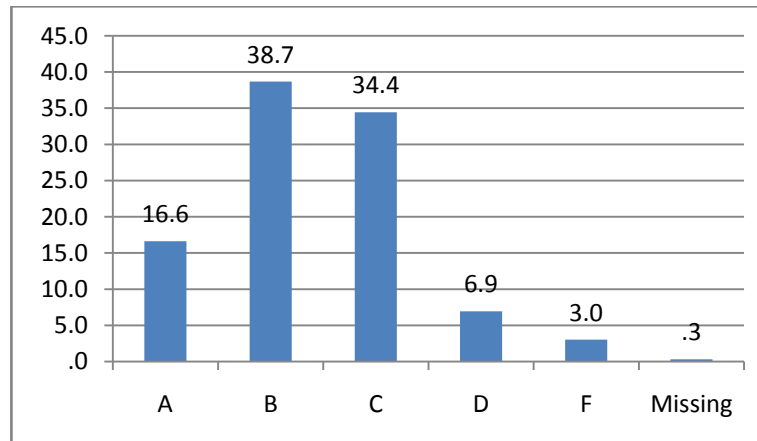
	Frequency	Percent
Yes	114	34.4
No	215	65.0
Missing	2	.6
Total	331	100.0



About one third of the respondents have and use an online camera and head phone for video conferencing.

3. What grade do you think you will receive in this class?

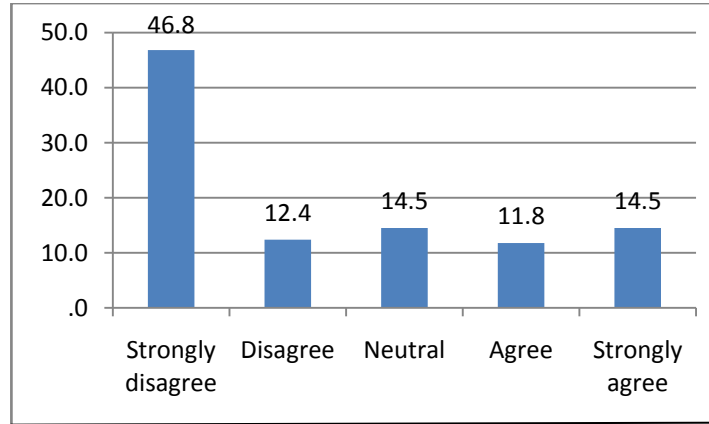
	Frequency	Percent
A	55	16.6
B	128	38.7
C	114	34.4
D	23	6.9
F	10	3.0
Missing	1	.3
Total	331	100.0



The majority of the students expect either a B or a C in their classes.

4. I regularly attend tutoring on campus.

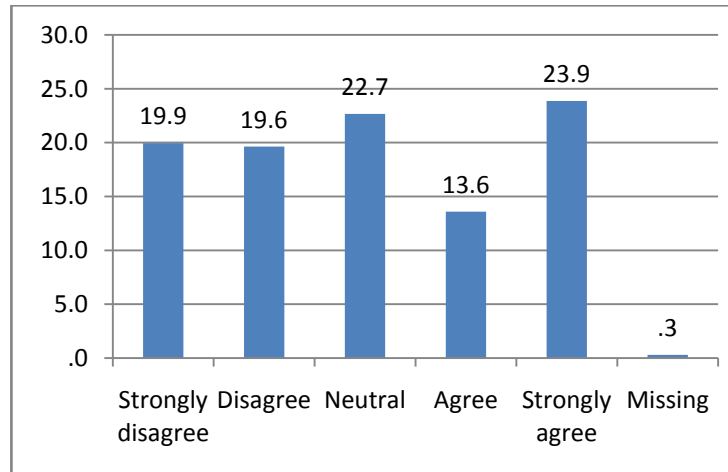
	Frequency	Percent
Strongly disagree	155	46.8
Disagree	41	12.4
Neutral	48	14.5
Agree	39	11.8
Strongly agree	48	14.5
Total	331	100.0



Only about a quarter of the respondents either agreed or strongly agreed that they regularly attended tutoring on campus.

5. My schedule makes it difficult for me to attend tutoring on campus.

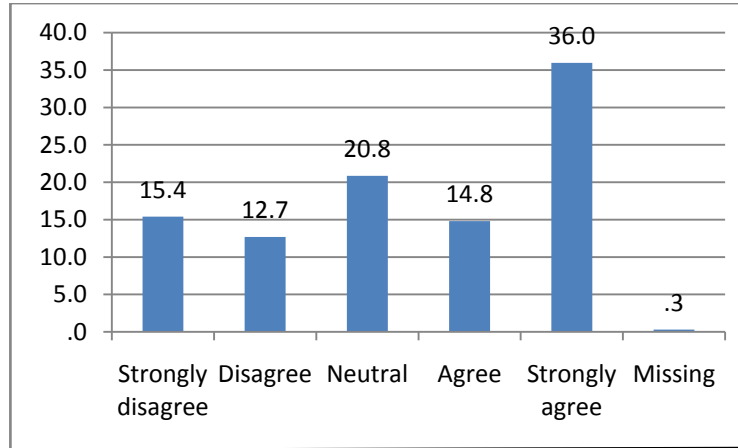
	Frequency	Percent
Strongly disagree	66	19.9
Disagree	65	19.6
Neutral	75	22.7
Agree	45	13.6
Strongly agree	79	23.9
Missing	1	.3
Total	331	100.0



About 40% of the respondents either agreed or strongly agreed that it was difficult for them to attend tutoring on campus.

6. If I could access online tutoring from off-campus, I would use it.

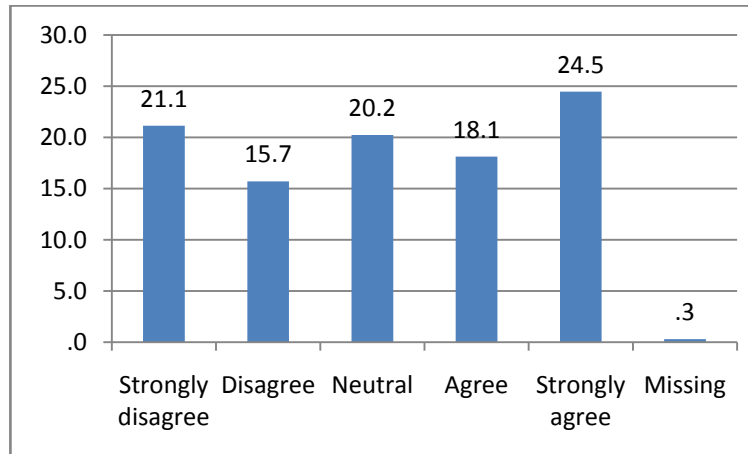
	Frequency	Percent
Strongly disagree	51	15.4
Disagree	42	12.7
Neutral	69	20.8
Agree	49	14.8
Strongly agree	119	36.0
Missing	1	.3
Total	331	100.0



A little above 50% of the respondents either agreed or strongly agreed that they would use the online tutoring from off-campus if they could access it.

7. I would use online tutoring in place of attending tutoring on campus.

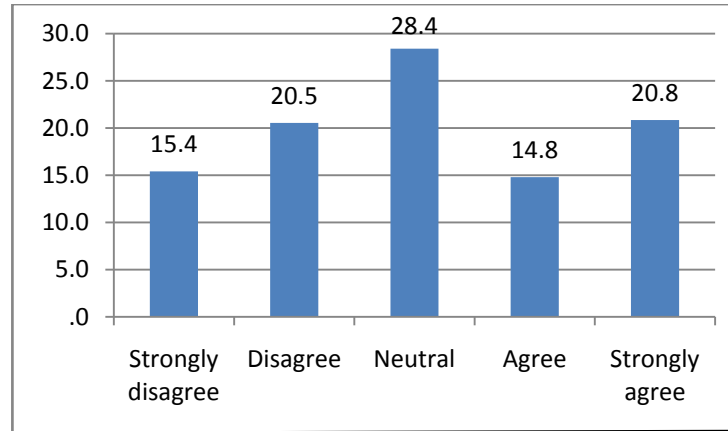
	Frequency	Percent
Strongly disagree	70	21.1
Disagree	52	15.7
Neutral	67	20.2
Agree	60	18.1
Strongly agree	81	24.5
Missing	1	.3
total	331	100.0



A slightly higher percentage of respondents would use online tutoring instead of attending tutoring on campus (42.6% vs. 36.8%).

8. I would use both online tutoring and on-campus tutoring services.

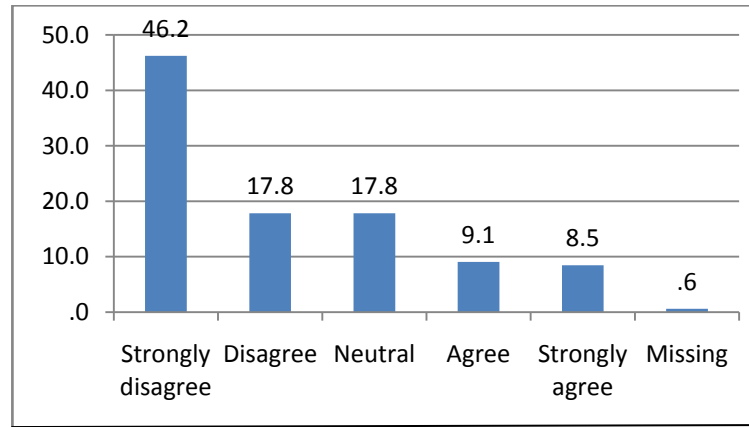
	Frequency	Percent
Strongly disagree	51	15.4
Disagree	68	20.5
Neutral	94	28.4
Agree	49	14.8
Strongly agree	69	20.8
Total	331	100.0



The percentages of respondents who were positive or negative toward using both services are evenly split.

9. I have no need for tutoring for any of my courses.

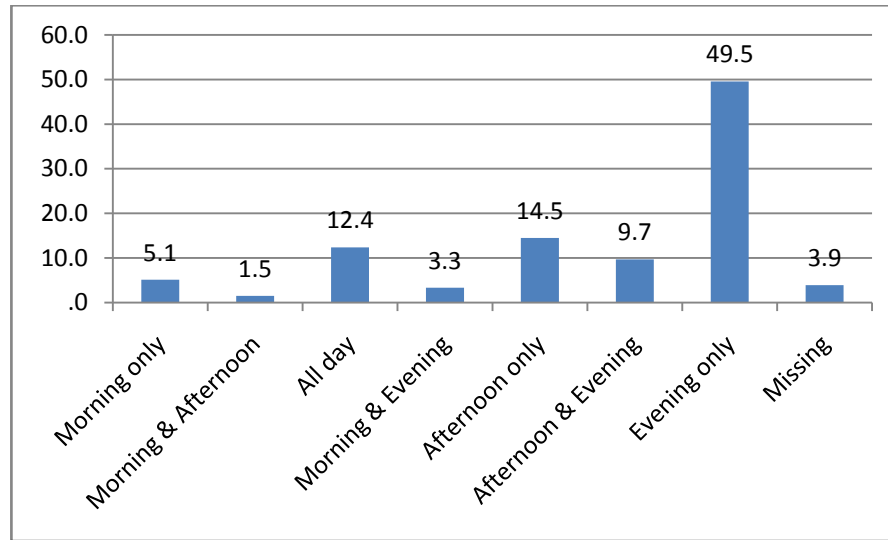
	Frequency	Percent
Strongly disagree	153	46.2
Disagree	59	17.8
Neutral	59	17.8
Agree	30	9.1
Strongly agree	28	8.5
Missing	2	.6
Total	331	100.0



The majority of the respondents (64%) are against this statement. Therefore, the majority of the respondents need tutoring for their courses.

10. What time would you use online tutoring?

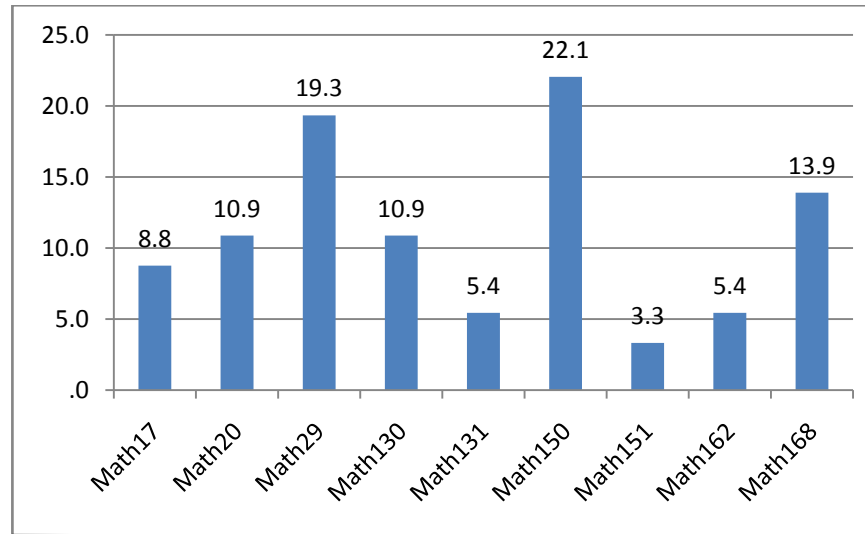
	Frequency	Percent
Morning only	17	5.1
Morning & Afternoon	5	1.5
All day	41	12.4
Morning & Evening	11	3.3
Afternoon only	48	14.5
Afternoon & Evening	32	9.7
Evening only	164	49.5
Missing	13	3.9
Total	331	100.0



The best time to offer online tutoring is in the evening. The next best time is in the afternoon.

11. Please select the math class you are enrolled in below – follow your instructor’s directions.

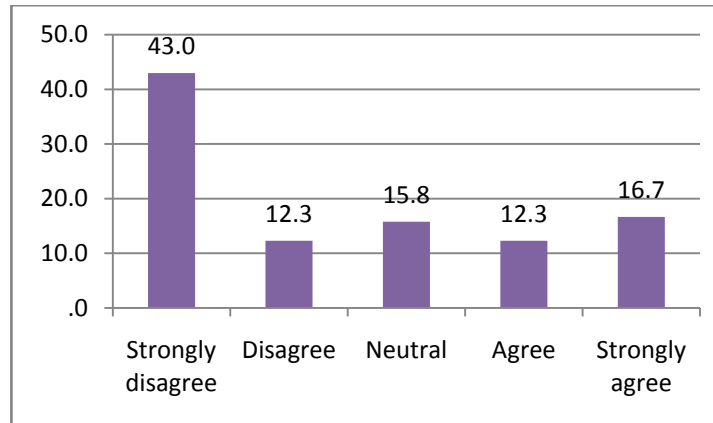
	Frequency	Percent
Math017	29	8.8
Math020	36	10.9
Math029	64	19.3
Math130	36	10.9
Math131	18	5.4
Math150	73	22.1
Math151	11	3.3
Math162	18	5.4
Math168	46	13.9
Total	331	100.0



The Respondents who have and use an online camera and head phones for video conferencing (N=114):

4. I regularly attend tutoring on campus.

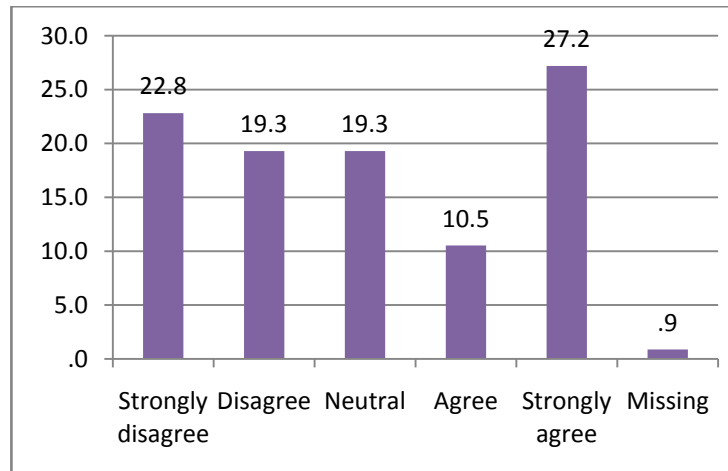
	Frequency	Percent
Strongly disagree	49	43.0
Disagree	14	12.3
Neutral	18	15.8
Agree	14	12.3
Strongly agree	19	16.7
Total	114	100.0



Only about 30% of the respondents either agreed or strongly agreed that they regularly attended tutoring on campus.

5. My schedule makes it difficult for me to attend tutoring on campus.

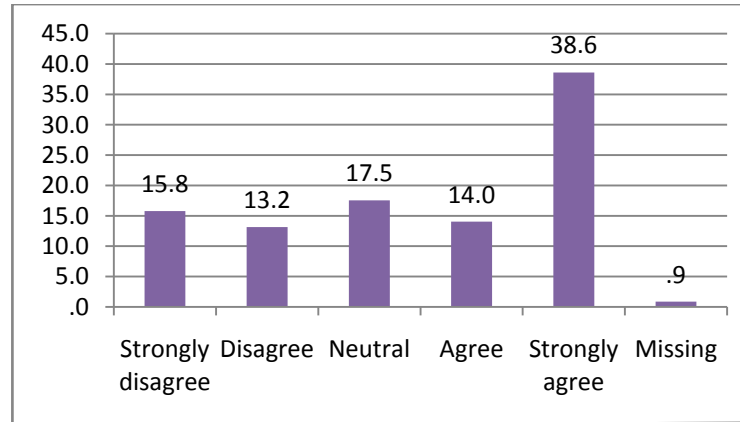
	Frequency	Percent
Strongly disagree	26	22.8
Disagree	22	19.3
Neutral	22	19.3
Agree	12	10.5
Strongly agree	31	27.2
Missing	1	.9
Total	114	100.0



About 40% of the respondents either agreed or strongly agreed that it was difficult for them to attend tutoring on campus.

6. If I could access online tutoring from off-campus, I would use it.

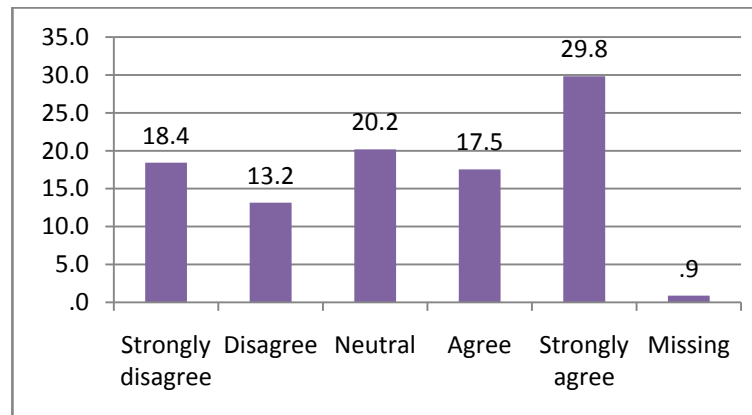
	Frequency	Percent
Strongly disagree	18	15.8
Disagree	15	13.2
Neutral	20	17.5
Agree	16	14.0
Strongly agree	44	38.6
Missing	1	.9
Total	114	100.0



A little above 50% of the respondents either agreed or strongly agreed that they would use the online tutoring from off-campus if they could access it.

7. I would use online tutoring in place of attending tutoring on campus.

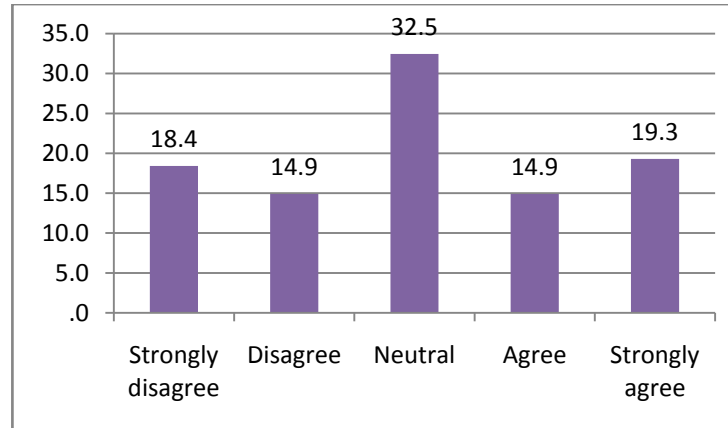
	Frequency	Percent
Strongly disagree	21	18.4
Disagree	15	13.2
Neutral	23	20.2
Agree	20	17.5
Strongly agree	34	29.8
Missing	1	.9
Total	114	100.0



The percentage of respondents would use online tutoring instead of attending tutoring on campus is about 15% higher than the ones who would not (47.3% vs. 31.7%).

8. I would use both online tutoring and on-campus tutoring services.

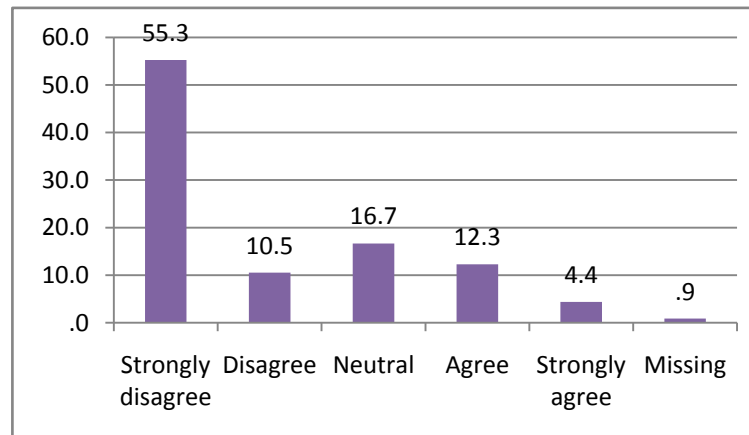
	Frequency	Percent
Strongly disagree	21	18.4
Disagree	17	14.9
Neutral	37	32.5
Agree	17	14.9
Strongly agree	22	19.3
Total	114	100.0



The percentages of respondents who were positive or negative toward using both services are evenly split.

9. I have no need for tutoring for any of my courses.

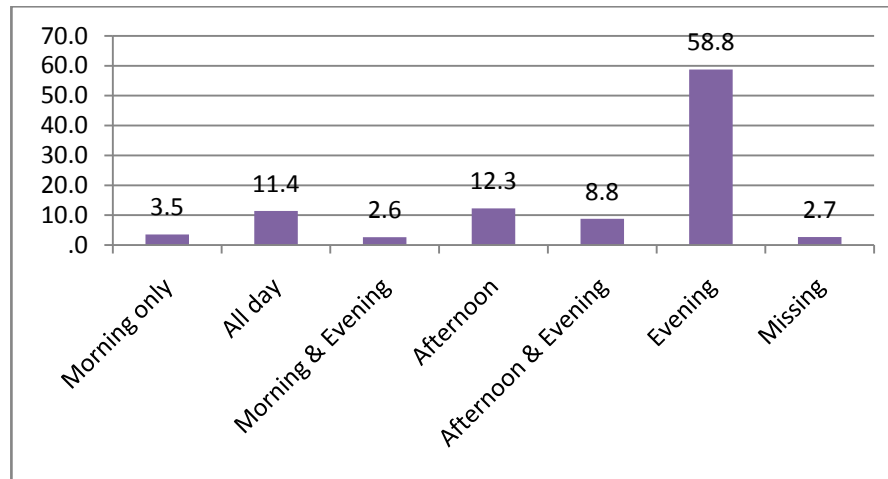
	Frequency	Percent
Strongly disagree	63	55.3
Disagree	12	10.5
Neutral	19	16.7
Agree	14	12.3
Strongly agree	5	4.4
Missing	1	.9
Total	114	100.0



The majority of the respondents (65.8%) are against this statement. Therefore, the majority of the respondents need tutoring for their courses.

10. What time would you use online tutoring?

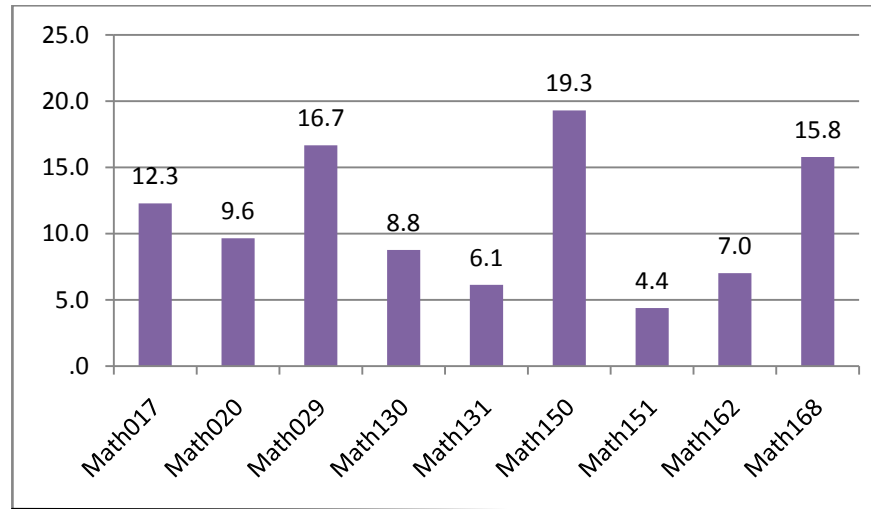
	Frequency	Percent
Morning only	4	3.5
All day	13	11.4
Morning & Evening	3	2.6
Afternoon	14	12.3
Afternoon & Evening	10	8.8
Evening	67	58.8
Missing	3	2.7
Total	114	100.0



The best time to offer online tutoring is in the evening. The next best time is in the afternoon.

11. Please select the math class you are enrolled in below – follow your instructor’s directions.

	Frequency	Percent
Math017	14	12.3
Math020	11	9.6
Math029	19	16.7
Math130	10	8.8
Math131	7	6.1
Math150	22	19.3
Math151	5	4.4
Math162	8	7.0
Math168	18	15.8
Total	114	100.0



In general, the students who have and use an online camera and head phones for video conferencing show a little more positive intention in using online tutoring in comparison with the ones who do not have the equipment. However, the two groups are quite similar in their responses.

Calculus Readiness Workshop Data Analysis Results – Winter 2010 Math 151

1. Descriptive Data analysis

- Final Grade Comparisons

The course success rates (the combination of A, B, and C) are higher for Calculus Readiness Workshop participants (96.9%) than non-participants (62.5%). A higher percentage of participants achieved A or B or C than non-participants as well.

	A	B	C	A, B, & C Combined	D	FW	W	Total
Non-Participants	12.5% (2)	25.0% (4)	25.0% (4)	62.5% (10)	12.5% (2)	12.5% (2)	12.5% (2)	100% (16)
Participants	31.3% (10)	34.4% (11)	31.3% (10)	96.9% (31)	3.1% (1)	0.0% (0)	0.0% (0)	100% (32)
Combined	25% (12)	31.3% (15)	29.2% (14)	85.4% (41)	6.3% (3)	4.2% (2)	4.2% (2)	100% (48)

2. Chi-square:

A Chi-square test was conducted to see if there is a significant relationship between *Participating in the Calculus Readiness Workshop* and *Passing the Course* (the combination of A, B, and Cs). Based on the Fisher's Exact Test result ($p=0.004$), we can conclude that *Participating in Calculus Readiness Workshop* and *Passing the Course* are significantly related. The effect size for the relationship is moderate ($\phi=0.459$).

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	10.118 ^a	1	.001		
Continuity Correction ^b	7.547	1	.006		
Likelihood Ratio	9.810	1	.002		
Fisher's Exact Test				.004	.004
Linear-by-Linear Association	9.908	1	.002		
N of Valid Cases	48				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.33.

b. Computed only for a 2x2 table

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal Phi	.459	.001
Cramer's V	.459	.001
N of Valid Cases	48	

3. Logistic Regression Tests:

Next, two logistic regression tests were conducted to find out if *Participating in the Calculus Readiness Workshop* affected the level of the grades that a student received and also if *the frequency of Participating in the Calculus Readiness Workshop* affected the level of the grades that a student received. The level of the grades was coded as: A (level 4), B (level 3), C (level 2), and D, F, W, FW (Level 1).

- In the first Logistic Regression, the overall model is significant ($p=0.009$). *Participating in the Calculus Readiness Workshop* has significantly affected the level of the grades a student achieved. For students who participated in the program, we would expect a 1.551 increase in the expected level of grades in the log odds scale. In other words, the odds of passing the class are 4.72 times ($\exp b=4.72$) greater for students who participated in the Calculus Readiness Workshop than the ones who did not participate in the program.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	27.839			
Final	20.935	6.904	1	.009

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Grade_Level = 1]	-.862	.504	2.927	1	.087	-1.849	.125
	[Grade_Level = 2]	.839	.501	2.802	1	.094	-.143	1.821
	[Grade_Level = 3]	2.284	.580	15.483	1	.000	1.146	3.421
Location	Workshop	1.551	.596	6.777	1	.009	.383	2.718

Link function: Logit.

- In the second Logistic Regression, the overall model is significant ($p=0.005$). *The frequency of participating in the Calculus Readiness Workshop* has significantly affected the level of the grades a student achieved. For each unit of increase in the frequency of participation (i.e., going from 0 to 1 time), we would expect a 0.295 increase in the expected level of grades in the log odds scale. In other words, the odds of getting As and Bs are 1.34 times ($\text{exp}b=1.34$) greater for each unit of increase in the frequency of participating in the workshop.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	53.973			
Final	45.951	8.021	1	.005

Link function: Logit.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Grade_Level = 1]	-.981	.476	4.243	1	.039	-1.914	-.048
	[Grade_Level = 2]	.695	.450	2.383	1	.123	-.187	1.578
	[Grade_Level = 3]	2.182	.543	16.116	1	.000	1.117	3.247
Location	total	.295	.107	7.565	1	.006	.085	.504

Link function: Logit.

Focus-on-Calculus Peer Mentoring Program Data Analysis Results
Winter 2010
Math 151 & 175

Math 151

4. Descriptive Data analysis

- Final Grade Comparisons

The course success rates (the combination of A, B, and C) are higher for Focus-on-Calculus Peer Mentoring Program mentees (93.3%) than non-mentees (81.8%). A higher percentage of mentees achieved A or B or C than non-mentees as well.

	A	B	C	A, B, & C Combined	D	FW	W	Total
Non-Mentees	24.2% (8)	30.3% (10)	27.3% (9)	81.8% (27)	6.1% (2)	6.1% (2)	6.1% (2)	100% (33)
Mentees	26.7% (4)	33.3% (5)	33.3% (5)	93.3% (14)	6.7% (1)	0.0% (0)	0.0% (0)	100% (15)
Combined	25% (12)	31.3% (15)	29.2% (14)	85.4% (41)	6.3% (3)	4.2% (2)	4.2% (2)	100% (48)

5. Chi-square:

A Chi-square test was conducted to see if there is a significant relationship between *Participating in Focus-on-Calculus Peer Mentoring Program* and *Passing the Course* (the combination of A, B, and Cs). Based on the Chi-square test results ($X^2=1.098$, $df=1$, $p=0.295$), we can conclude that *Participating in Focus-on-Calculus Peer Mentoring program* and *Passing the Course* are not significantly related.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.098 ^a	1	.295		
Continuity Correction ^b	.368	1	.544		
Likelihood Ratio	1.239	1	.266		
Fisher's Exact Test				.409	.284
Linear-by-Linear Association	1.075	1	.300		
N of Valid Cases	48				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.19.

b. Computed only for a 2x2 table

In conclusion, the descriptive data analysis results show that the Math151 course success rates for Focus-on-Calculus Peer Mentoring Program mentees are higher than non-mentees. However, participation in this program and passing the Course are not significantly related ($X^2=1.098$, $df=1$, $p=0.295$).

Math 175

1. Descriptive Data analysis

• Final Grade Comparisons

The course success rates (the combination of A, B, and C) are higher for Focus-on-Calculus Peer Mentoring Program non-mentees (75.0%) than mentees (50.0%). A higher percentage of non-mentees achieved A or B or C than mentees as well. It is likely that non-mentees are academically less prepared students compared to non-mentees. Thus, they demand more support either out of the Mentoring program or from other programs.

	A	B	C	A, B, & C Combined	D	F	W	Total
Non-Mentees	17.9% (5)	17.9% (5)	39.3% (11)	75.0% (21)	7.1% (2)	14.3% (4)	3.6% (1)	100% (28)
Mentees	10.0% (1)	10.0% (1)	30.0% (3)	50.0% (5)	40.0% (4)	10.0% (1)	0.0% (0)	100% (10)
Combined	15.8% (6)	15.8% (6)	36.8% (14)	68.4% (26)	15.8% (6)	13.2% (5)	2.6% (1)	100% (38)

**Success and Retention Rates for Math 151 and 175 Courses
 Summer and Winter Sessions**

Math 151

Grade Distributions – Summer Sessions

	A	B	C	Success Rate¹	D	F	W	Retention Rate²	Total
Summer 2004	19.4% (7)	22.2% (8)	27.8% (10)	69.4% (25)	22.2% (8)	2.8% (1)	5.6% (2)	94.4% (34)	100% (36)
Summer 2005	26.1% (6)	39.1% (9)	26.1% (6)	91.3% (21)	0.0% (0)	4.3% (1)	4.3% (1)	95.7% (22)	100% (23)
Summer 2006	42.9% (15)	25.7% (9)	14.3% (5)	82.9% (29)	5.7% (2)	5.7% (2)	5.7% (2)	94.3% (33)	100% (35)
Summer 2007	24.6% (15)	36.1% (22)	13.1% (8)	73.8% (45)	4.9% (3)	9.8% (6)	11.5% (7)	88.5% (54)	100% (61)
Summer 2008	51.1% (24)	19.1% (9)	19.1% (9)	89.4% (42)	8.5% (4)	0.0% (0)	2.1% (1)	97.9% (46)	100% (47)
Summer 2009	10.0% (3)	26.7% (8)	26.7% (8)	63.3% (19)	20.0% (6)	3.3% (1)	13.3% (4)	86.7% (26)	100% (30)

	Drop or No Show³
Summer 2004⁴	0.0% (0)
Summer 2005⁴	0.0% (0)
Summer 2006⁴	0.0% (0)
Summer 2007	12.9% (9)
Summer 2008	19.0% (11)
Summer 2009	43.4% (23)

Grade Distributions – Winter Sessions

	A	B	C	Success Rate¹	D	F	W	Retention Rate²	Total
Winter 2008	51.3% (20)	23.1% (9)	15.4% (6)	89.7% (35)	5.1% (2)	0.0% (0)	5.1% (2)	94.9% (37)	100% (39)
Winter 2009	19.5% (8)	24.4% (10)	26.8% (11)	70.7% (29)	12.2% (5)	4.9% (2)	12.2% (5)	87.8% (36)	100% (41)
Winter 2010⁵	25.0% (12)	31.3% (15)	29.2% (14)	85.4% (41)	6.3% (3)	4.2% (2)	4.2% (2)	95.8% (46)	100% (48)

	Drop or No Show³
Winter 2008	22.0% (11)
Winter 2009	25.5% (14)
Winter 2010	12.7% (7)

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Grade Distributions – Summer Sessions

	A	B	C	Success Rate¹	D	F	W	Retention Rate²	Total
Summer 2006	15.0% (3)	10.0% (2)	50.0% (10)	75.0% (15)	10.0% (2)	5.0% (1)	10.0% (2)	90.0% (18)	100% (20)
Summer 2007	13.6% (3)	27.3% (6)	22.7% (5)	63.6% (14)	13.6% (3)	4.5% (1)	18.2% (4)	81.8% (18)	100% (22)
Summer 2008	17.6% (6)	11.8% (4)	14.7% (5)	44.1% (15)	26.5% (9)	23.5% (8)	5.9% (2)	94.1% (32)	100% (34)
Summer 2009	10.5% (4)	28.9% (11)	15.8% (6)	55.3% (21)	23.7% (9)	13.2% (5)	7.9% (3)	92.1% (35)	100% (38)

	Drop or No Show³
Summer 2006⁴	0.0% (0)
Summer 2007	18.5% (5)
Summer 2008	26.1% (12)
Summer 2009	24.0% (12)

Grade Distributions – Winter Sessions

	A	B	C	Success Rate¹	D	F	W	Retention Rate²	Total
Winter 2008	15.6% (5)	18.8% (6)	15.6% (5)	50.0% (16)	21.9% (7)	15.6% (5)	12.5% (4)	87.5% (28)	100% (32)
Winter 2009	3.7% (1)	37.0% (10)	29.6% (8)	70.4% (19)	14.8% (4)	11.1% (3)	3.7% (1)	96.3% (26)	100% (27)
Winter 2010	15.8% (6)	15.8% (6)	36.8% (14)	68.4% (26)	15.8% (6)	13.2% (5)	2.6% (1)	97.4% (37)	100% (38)

	Drop or No Show³
Winter 2008	34.7% (17)
Winter 2009	47.1% (24)
Winter 2010	19.1% (9)

Notes:

1. Success rate is the number of “A”, “B”, “C”, and “CR” grades divided by the number of all grades.
2. Retention rate is the number of ‘A’, ‘B’, ‘C’, ‘D’, ‘F’, ‘CR’, ‘NC’, ‘I’, and ‘FW’ grades divided by the number of all grades
3. Drop or no show rate is the percent of students who dropped the class or did not show up before census divided by all the students who have a record in the database
4. Zero percentage for Summer 04-06 drop or no show data is because we were in the old legacy system and it did not store such information
5. Data in background means the Focus-on-Calculus Peering Mentoring program was offered in that semester

Conclusion:

Historical records indicate that the success rates and retention rates fluctuate from semester to semester. The non-significant statistical results for Focus-on-Calculus Peer Mentoring program in Winter 2010 may be a result of several reasons. In order to obtain

a better understanding of the issue on hand, it is necessary to interview the students who participated in the program but still failed the class and ask them if adding more session time or lowering the mentee/mentor ratio would have helped them succeed in the class. In other words, what are the reasons that these students failed the class although they participated in the program? Without a good measure of previous academic preparation, quantitative data analysis cannot fully address this question simply with an assumption that students are equally prepared. However, qualitative data will help. If these students can be located and invited for interviews, results from the qualitative study will offer us some explanations on this issue, at least partially.