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CC: Todd Shaw
From: Stephen Gillespie and Monique Perez
Date: 12/6/2012
Subject: Report on the Math Lab Facilities

Introduction

Throughout the semester, we have noted that the Math Lab facilities seemed inadequate to accommodate the number of students in need of math help. The room is too small and, during certain hours of the day, it becomes overcrowded. On many occasions, the overflow of students has caused other students to opt to leave the Math Lab. The room can also become too noisy and uncomfortable for students to concentrate. In addition, during busier hours, students have to wait for long periods of time to be helped by the lone staff member on duty. This report examines math labs at other schools, the importance of math labs, and facility needs according to the students as well as instructors.

Background

Michael Moore, vice provost and dean of undergraduate studies at the University of Texas at Arlington, said, "This is truly a national problem. The biggest hurdle for students trying to graduate from college is math" ("Math Emporium Aims"). College math has become a major issue for students who are trying to graduate from college. In fact, 65% of college professors in the 2007 ACT National Curriculum Survey stated that students in their states were poorly prepared for college level math (Sladky).

Research has shown that tutoring services can help to improve the performance of students in their math classes. A study done by Cuesta College's Tutorial Services along with Cuesta's Research Department shows that students who received ten hours or more of tutoring were 17.3% more successful than students who received no tutoring. Tutors not only give students different perspectives on the topics, but they also prevent professors from becoming overwhelmed by students seeking math help (Loli). Just as important as the availability of tutors, is how knowledgeable the tutors are. (Nolting 127). Brigham Young University requires that their tutors take three qualifying exams before they're allowed to work with students in the math lab. The qualifying exams determine what math level the tutors may offer assistance in (Loli).

Tutoring is not the only important factor in student success. An effective study environment can also have a dramatic impact. Each and every student is different when it comes to their study environments. Some students may like it quiet, while other students might like noise in the background. Some students might like things going on in their environment, whereas other students like to be isolated because they are easily distracted by the slightest movement. Comparably, some students find it easier to study in their bedrooms, while other students might think of their room as a place to relax or play ("Effective Study Environments"). Schools and individual educators should take

into account the differences in students' ideal study environments when designing classrooms, and become more involved in designing rooms that emphasize the needs of their students. Noises inside the classroom, such as air-ventilation systems and classroom appliances, can distract students from hearing the teacher. Noises outside the classroom can include busy streets, railroads, or airports, and these can be a serious distraction as well. Too many distractions in a student's learning environment can affect retention and understanding. Research has shown that noise in learning environments can impede cognitive processes (Bronzaft). Just as important as noise is temperature. Studies observing error rates and speed have shown that student work performance is affected when temperatures are 80 degrees or higher and 62 degrees or lower ("Temperature and School"). When students aren't learning the material, it is easy for them to become stressed. A little stress cannot do any harm to a student, but a lot of stress can have serious effects on the brain. When a person is stressed, they release cortisol in their brain. This cortisol eventually goes away as the stress alleviates. However, continual stress causes cortisol to stay in the brain longer, which can eventually start eating away at the brain. This cortisol affects the ability to learn new things and commit things to memory (Angela).

This report is an assessment of the current Math Lab facilities at Western in comparison to other math labs in the US. The information gathered is intended to determine whether improvements should be made toward the adequacy of the learning environment in the Math Lab.

Methods

A large concern at the beginning of this research project was in regards to the size of the current Math Lab. However, a review of the Vision 2020 referendum indicated plans to build a new Math Lab with 1,280 square feet. With this in mind, the research focused primarily on other aspects of the facilities and whether both the students and faculty felt anything could be improved in other ways. Surveys were distributed to gather information on the amount of use of the lab and opinions regarding possible improvements.

Time

Surveys were distributed over a two week period. Responses were sampled from students at different hours each day. The surveys were collected immediately after each student responded. At the end of the two weeks, the responses were tabulated. Instructor surveys were collected at the instructors' discretion.

Setting

All student surveys were distributed in the Math Lab at Western. Instructor surveys were created through the website Survey Monkey and were distributed electronically through email.

Exclusion Criteria

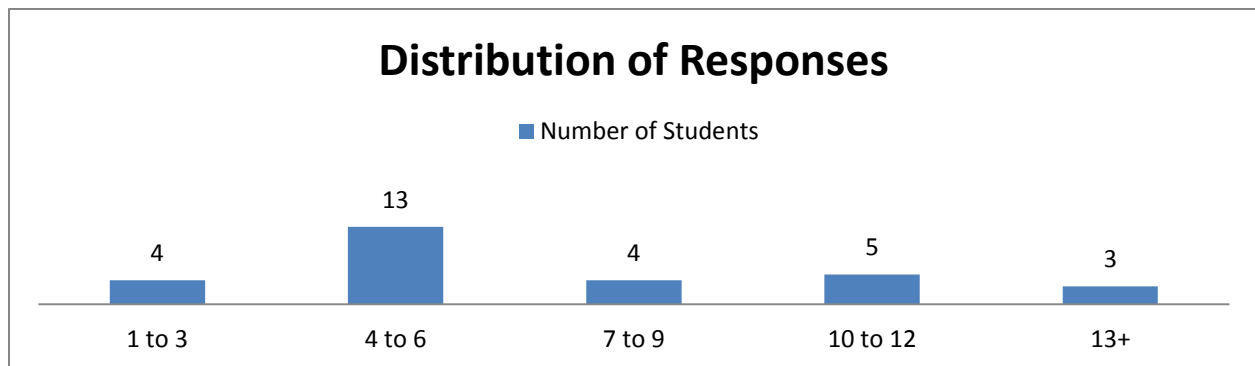
All students who were testing in the Math Lab at the time of each distribution were excluded from the survey. Students who did not visit the lab during any distributions were also not included.

Results

Student Survey

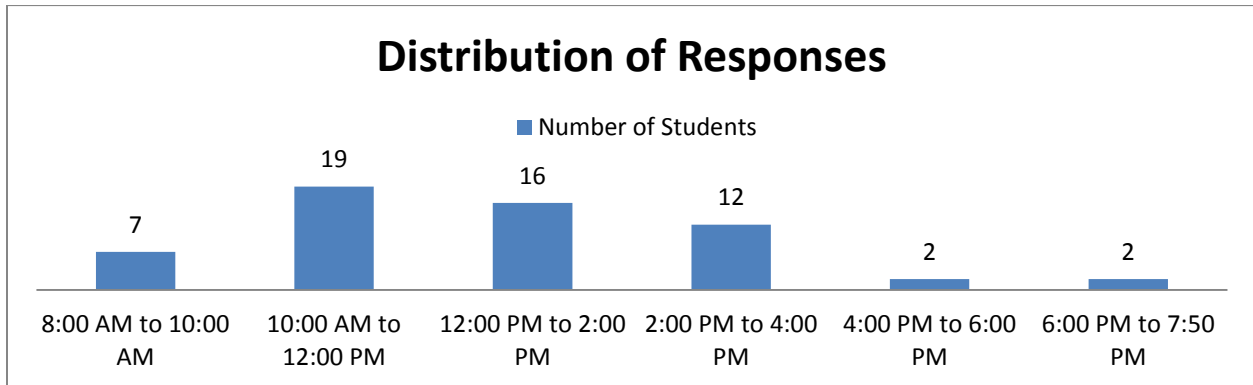
A 9- question survey of students using the Math Lab resulted in 29 responses. The questions asked and the responses given are listed below.

Question 1: How frequently, on average, do you visit the Math Lab per week?



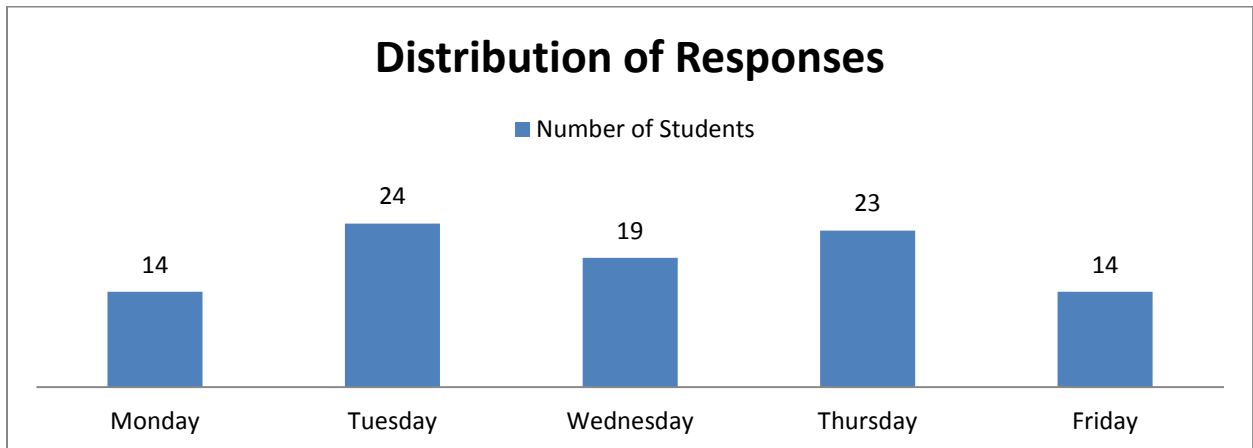
The majority of respondents indicated that they spend between 4 and 6 hours in the math lab per week. The second most common result was in the 10 to 12 hour category, while slightly fewer respondents indicated 1 to 3 hours or 7 to 9 hours evenly. Three respondents indicated that they spent 13 or more hours in the Math Lab per week, the least common response.

Question 2: What hours of the day do you typically use the Math Lab?



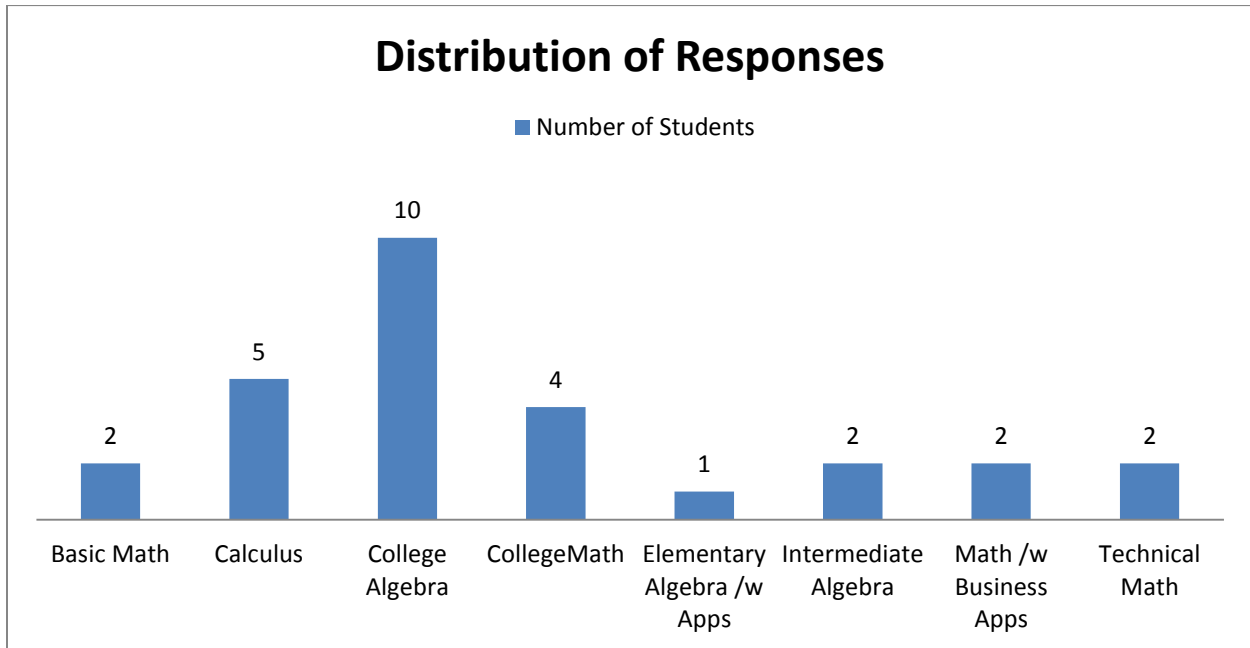
Respondents were instructed to circle all that apply. The students who responded indicated that 7 of them use the Math Lab between the hours of 8:00 AM and 10:00 AM, followed by a spike to 19 respondents using the facilities between 10:00 AM and 12:00 PM and then a steady decrease until 4:00 PM where usage dropped to 2 respondents per period between 4:00 PM and 6:00 PM and 6:00 PM and 7:50 PM, when the Math Lab closed.

Question 3: What days of the week do you typically use the Math Lab?



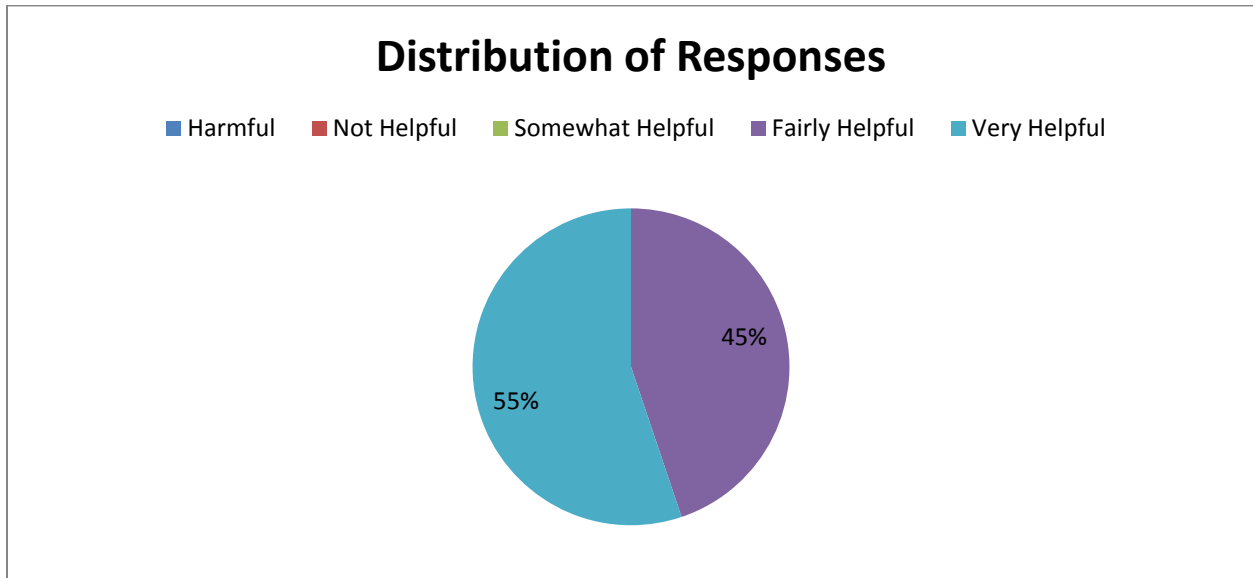
Respondents were instructed to circle all that apply. Respondents indicated most common use of the Math Lab on Tuesday with 24 respondents, followed closely by Thursday with 23. Wednesday was indicated by 19 respondents, and Monday and Friday were equally indicated by 14 respondents.

Question 4: What Math Class(es) are you currently enrolled in?



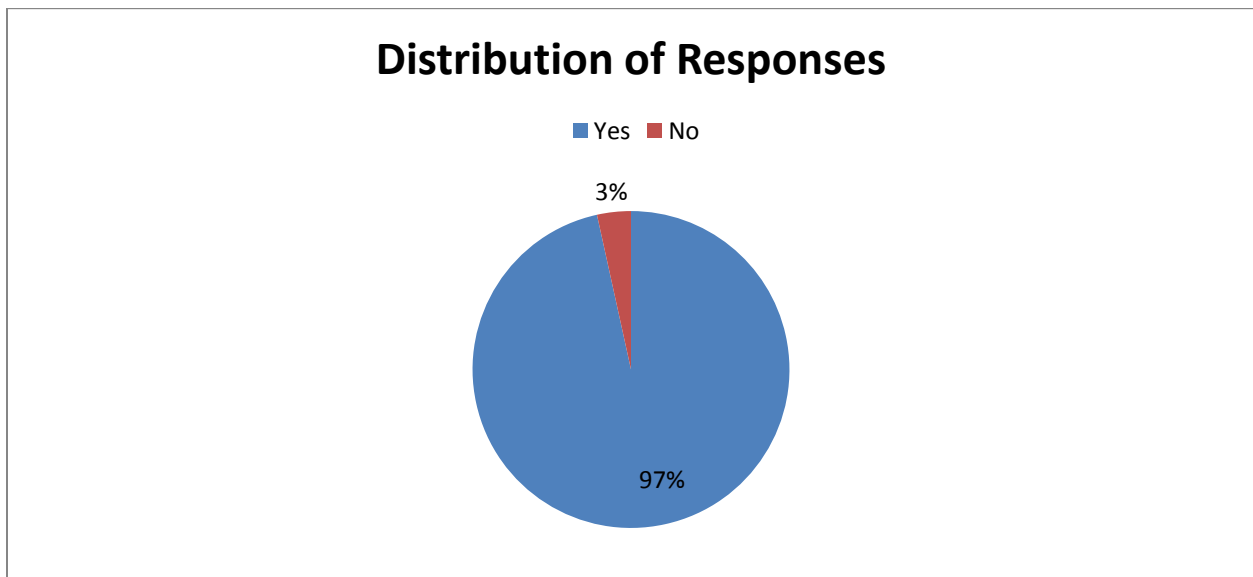
Responses indicated that the vast majority of surveyed students are enrolled in College Algebra with 10 responses. Calculus was the second most common response with 5 students. Basic Math, College Math, Intermediate Algebra, Math with Business Applications, and Technical Math were each indicated by 2 respondents. One student indicated he or she is enrolled in Elementary Algebra with Applications.

Question 5: How would you rate the helpfulness of the instructors in the Math Lab with regards to your current math classes?



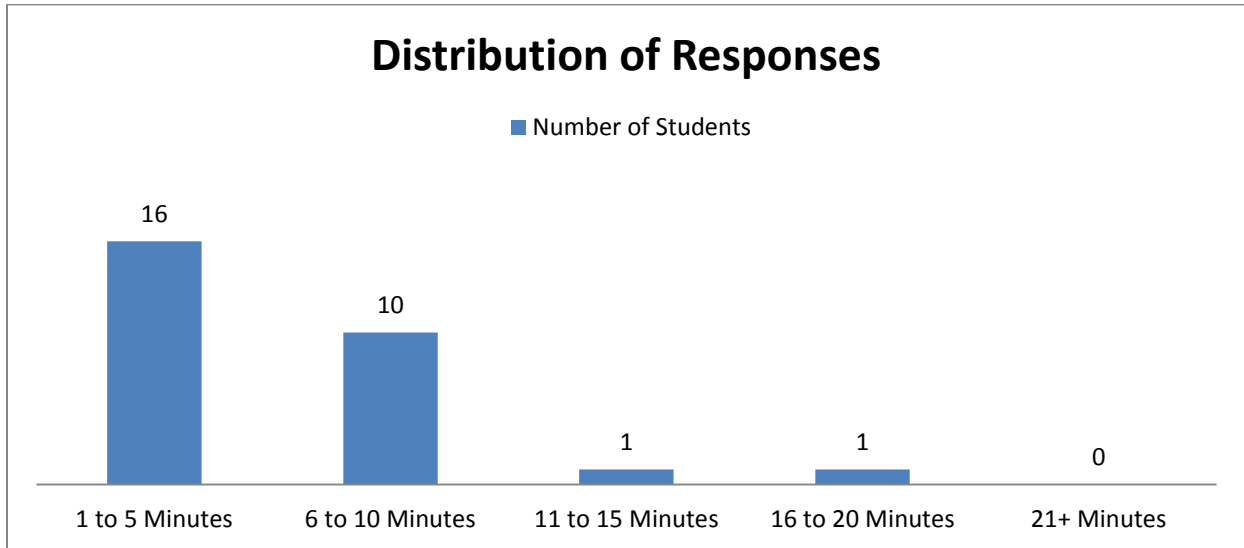
All respondents indicated that they found instructors to be Fairly Helpful or Very Helpful with the majority (55%) indicating the latter. No respondents selected Harmful, Not Helpful, or Somewhat Helpful as their response.

Question 6: Do you ever have to wait for help when you are in the Math Lab?



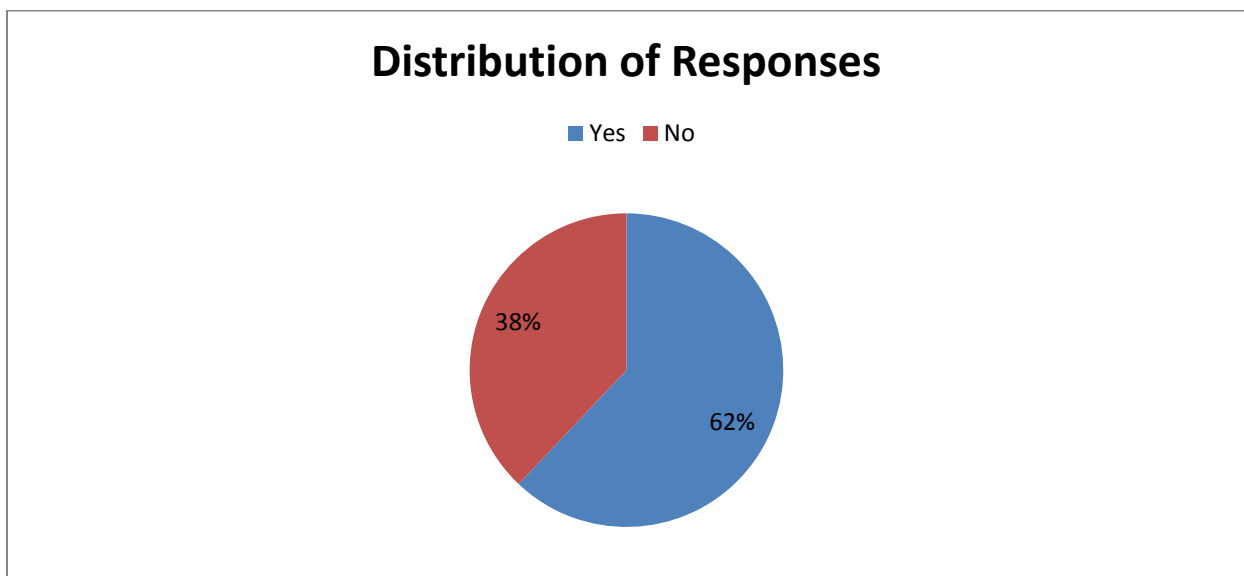
The vast majority of respondents indicated that they did have times they needed to wait for instructor help in the Math Lab. One student indicated he or she had not needed to wait for help.

Question 7: How long do you have to wait for help?



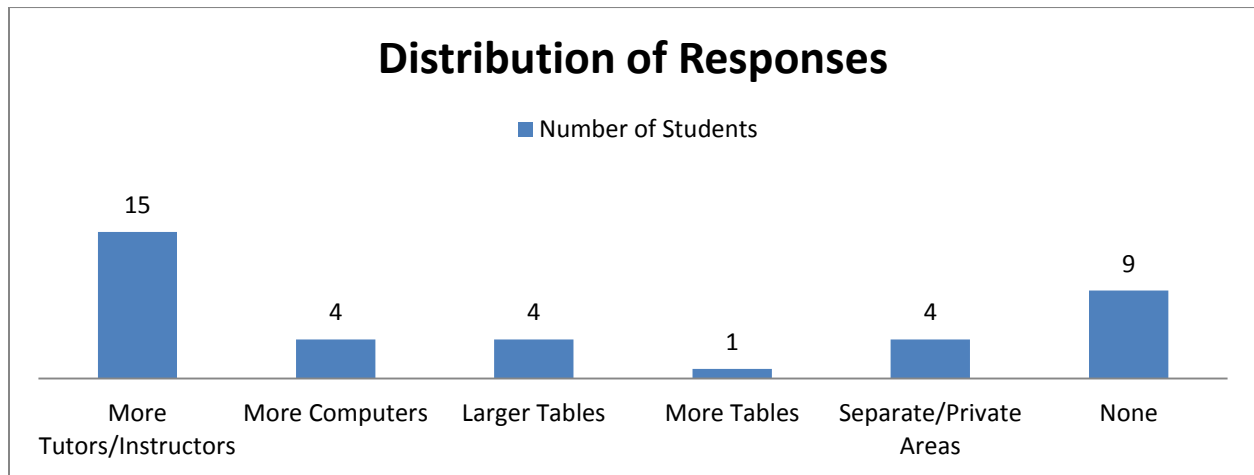
Respondents were instructed to answer this question if they had indicated “Yes” in response to the previous question. The greatest number of respondents indicated a wait of 1 to 5 minutes, followed by 6 to 10 minutes. Few students indicated that they needed to wait 11 to 15 or 16 to 20 minutes, and no responses indicated a wait of 21 or more minutes.

Question 8: Are you aware that there are math tutors available in the ASC?



Respondents indicated that the majority of them were aware of tutoring available in the Academic Success Center, with 38% of respondents indicated that they were not aware.

Question 9: The Vision 2020 referendum includes a new Math Lab that will be 1,280 square feet. Besides size, are there any improvements you think could be made concerning the Math Lab?

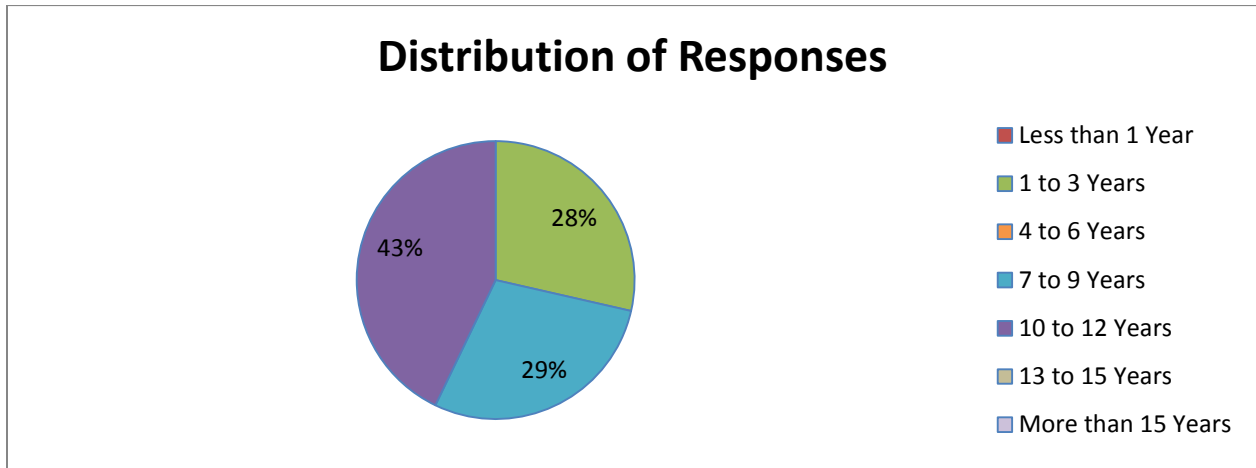


Of the students who responded to this question, the majority indicated they would like to see more tutors or instructors available for help in the Math Lab. Separate or private areas for group or testing use, more computers, and larger tables were suggested by an equal number of respondents. One respondent indicated he or she would like to see more tables in general, and 9 students did not indicate they had any suggestions for improvement.

Instructor Survey

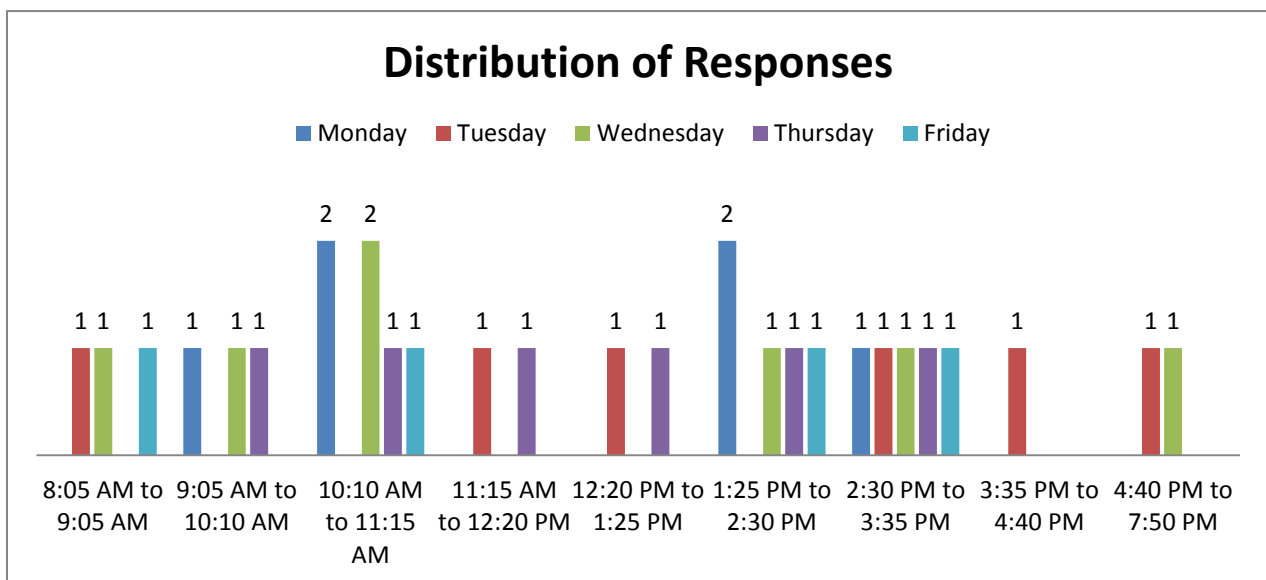
An 8-question survey was distributed to the 13 instructors who work in the Math Lab. Of those surveys 7 responses were returned. The questions asked and the responses given are listed below.

Question 1: How long have you been an instructor working in the math lab?



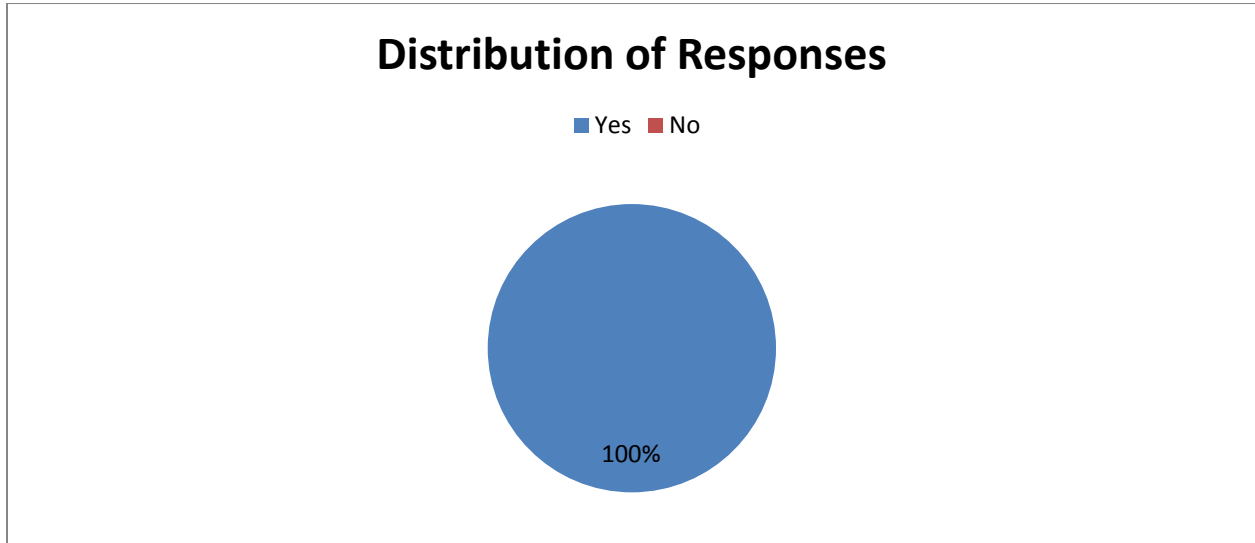
Of the responses gathered, two instructors indicated they had worked in the Math Lab between 1 and 3 years, two indicated between 7 and 9 years, and 3 indicated between 10 and 12 years. No other available response was indicated.

Question 2: What days and hours are you helping students in the Math Lab?



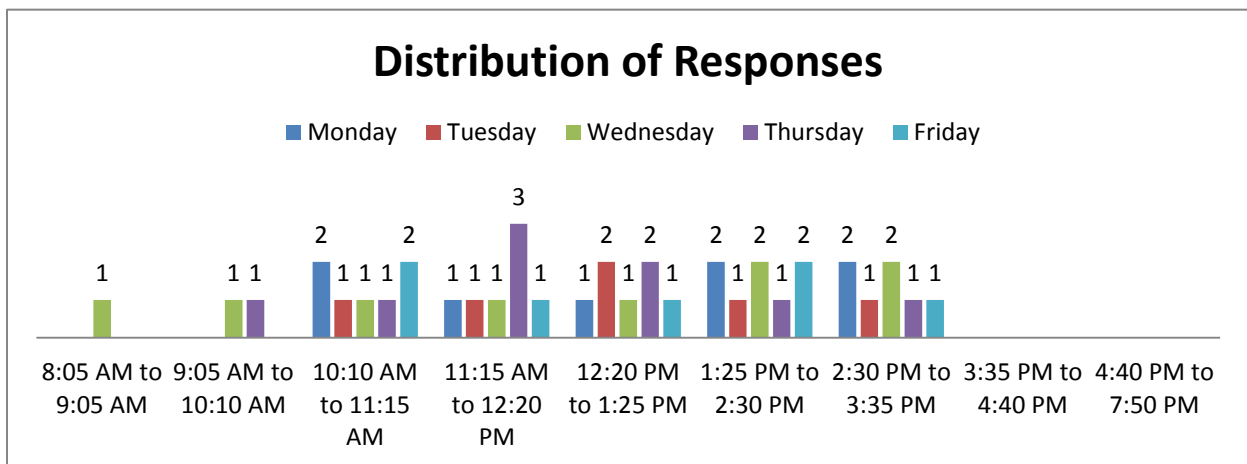
Respondents were instructed to mark all that apply. This question was asked to see what periods and days the respondents covered to indicate how complete or incomplete the data was. Responses are as indicated in the above chart.

Question 3: Are there any particular periods you work in the Math Lab that you feel are especially busy?



All respondents indicated that there were periods they worked in the Math Lab that they felt were especially busy. No respondents indicated they never felt especially busy in the facility.

Question 4: What periods do you work in the Math Lab that you feel are especially busy?



Respondents were instructed to answer if they had indicated “Yes” to the previous question, and instructed to select all that apply.

Periods indicated by 3 respondents to be especially busy:

- Thursdays between 11:15 AM and 12:20 PM

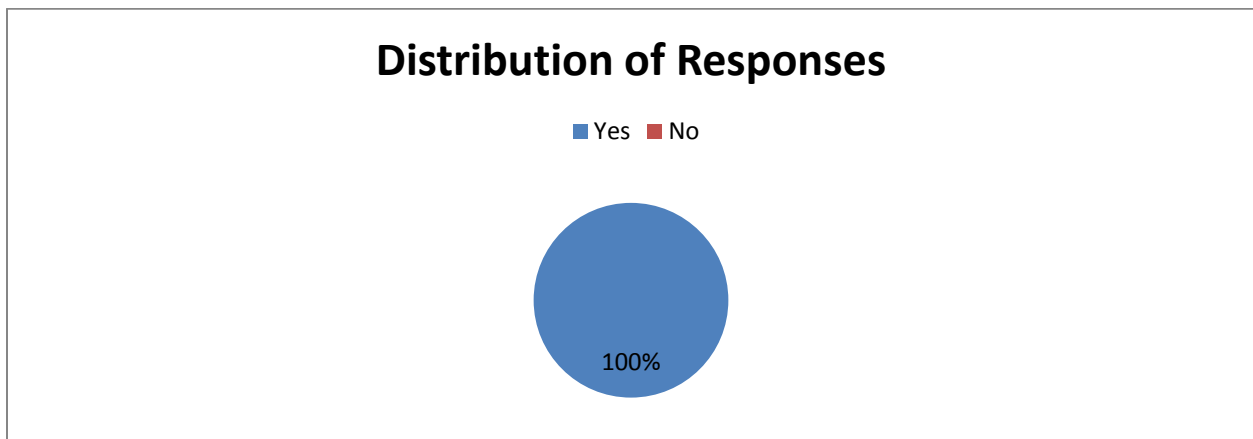
Periods indicated by 2 respondents to be especially busy:

- Mondays and Fridays between 10:10 AM and 11:15 AM
- Tuesdays and Thursdays between 12:20 PM and 1:25 PM
- Mondays, Wednesdays, and Fridays between 1:25 PM and 2:30 PM
- Mondays and Wednesdays between 2:30 PM and 3:35 PM

Periods indicated by 1 respondent to be especially busy

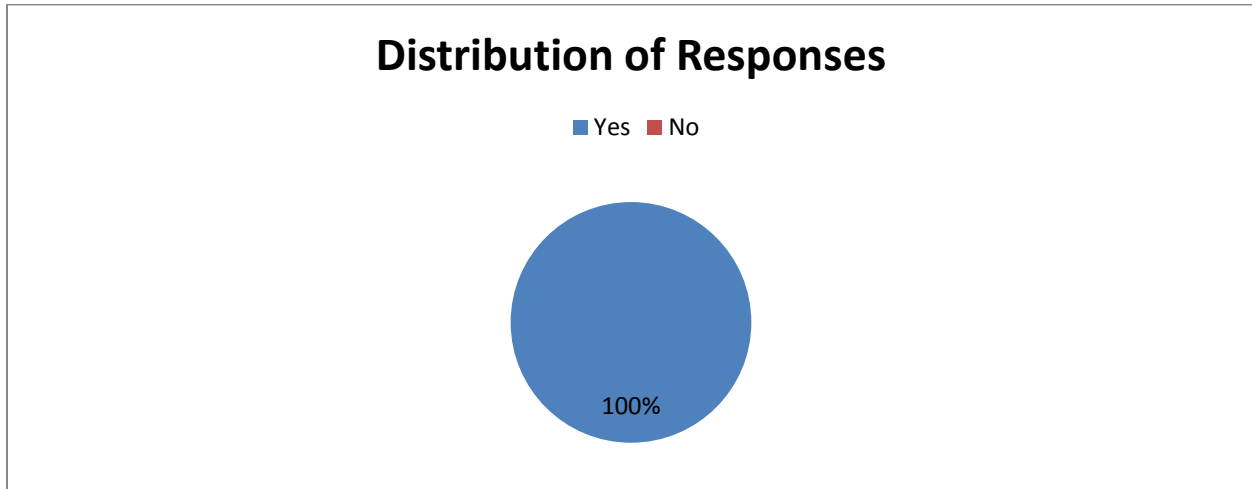
- Wednesdays between 8:05 AM and 9:05 AM
- Wednesdays and Thursdays between 9:05 AM and 10:10 AM
- Tuesdays, Wednesdays, and Thursdays between 10:10 AM and 11:15 AM
- Mondays, Tuesdays, Wednesdays, and Fridays between 11:15 AM and 12:10 PM
- Mondays, Wednesdays, and Fridays between 12:20 PM and 1:25 PM
- Tuesdays and Thursdays between 1:25 and 2:30 PM
- Tuesdays, Thursdays, and Fridays between 2:30 PM and 3:35 PM

Question 5: Do you ever feel overwhelmed by the number of students seeking help in the Math Lab?



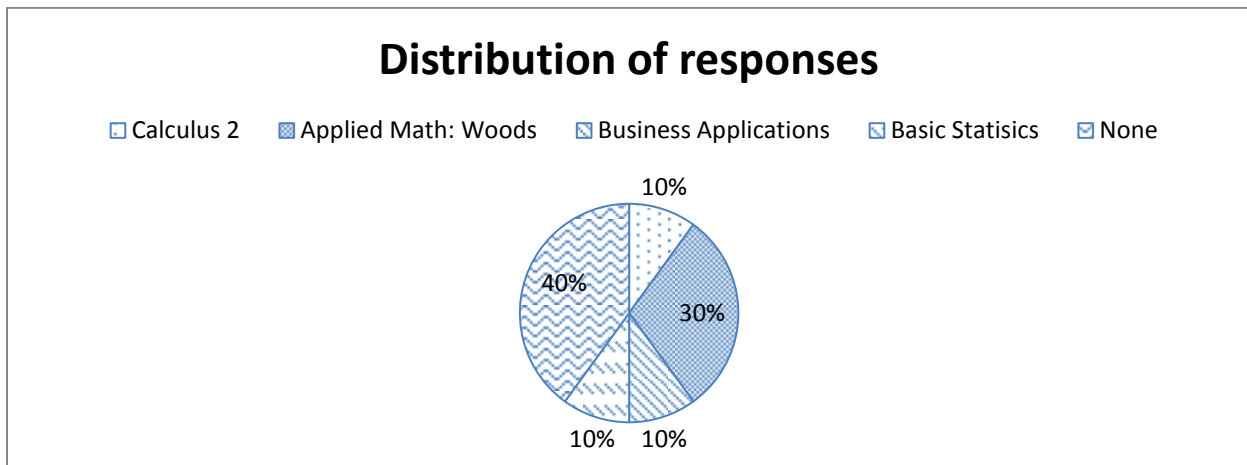
All respondents indicated they sometimes felt overwhelmed by the number of students seeking help in the Math Lab. No respondents indicated they never felt overwhelmed.

Question 6: Would you consider additional faculty for the Math Lab (other instructors, tutors, etc.) to be helpful during those times?



Respondents were instructed to respond to this question if they had answered “Yes” to the previous question. All respondents indicated that they would find additional faculty during busy periods to be helpful. No respondents indicated that they would not find additional faculty helpful.

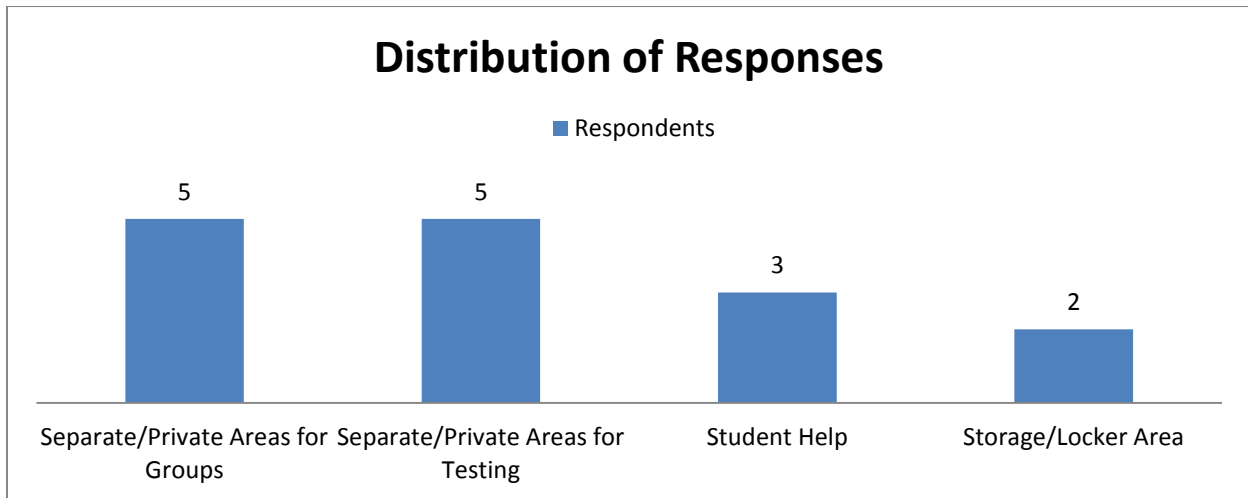
Question 7: Are there any math related courses offered at Western that you are uncomfortable helping students with?



Respondents were instructed to list any that apply. Most respondents (40%) indicated they felt comfortable helping with all math courses available at Western Technical College. The most common course respondents felt uncomfortable with was Applied Math: Woods. Calculus 2,

Business Applications, and Basic Statistics were each indicated by 1 respondent as something they felt uncomfortable helping students with.

Question 8: The Vision 2020 referendum includes a new Math Lab that will be 1,280 square feet. Besides size, are there any improvements you think could be made concerning the Math Lab?



Private or separated areas for groups and/or testing were both suggested by 5 different respondents. Student help in some form was suggested by 3 of the respondents, and storage or locker areas were suggested by 2 respondents as places for students to store backpacks, skateboards, cellphones and other items.

Conclusions

In conclusion, the results indicate that instructors feel overwhelmed during hours and days when the lab is especially busy. In addition, the majority of students indicated they have to wait for at least a short period of time for help when in the lab. There were numerous ideas for improvements that could be incorporated in the new Math Lab, the most important two being more staff to help students during busier hours and separate areas for study groups. It is currently unknown how the new Math Lab will be designed and what will be incorporated. Additional research is needed to give definitive conclusions.

Recommendation

The research question is whether the current Math Lab facility is adequate to meet the needs of Westerns students. In light of the information presented from the research and both surveys, we find that we agree largely with the suggestions provided by both the students and instructors. We recommend the new Math Lab incorporate a storage area for students' belongings, more tables that are also larger in size, more computers, separate areas for study groups and test takers, a separate area for the instructor to help students, and, most importantly, another instructor on duty to help students during busier hours.

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