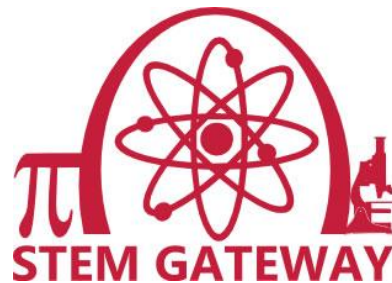# Assessment Techniques for a STEM Peer Tutor Program

NMHEAR, February 28, 2014

The STEM Gateway grant at UNM

▸ Focuses resources on undergraduate science and math courses that traditionally have low student success rates.

▸ Aims to increase the number of students attaining degrees in science, technology, engineering and mathematics (STEM).
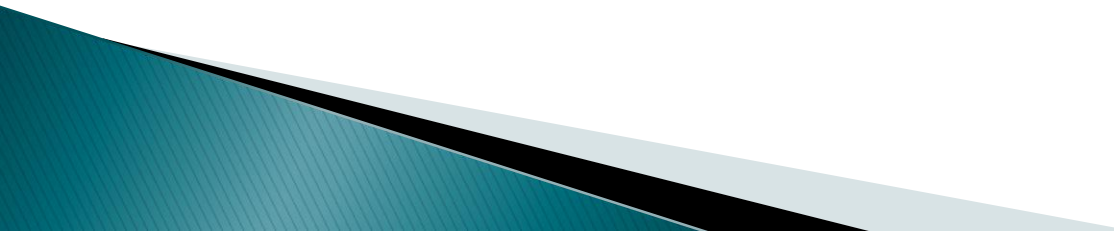
STEM GATEWAY

▸ Mission

Improve STEM instruction and student support at the University of New Mexico; Improve STEM graduation rates among Hispanic and/or low-income students.
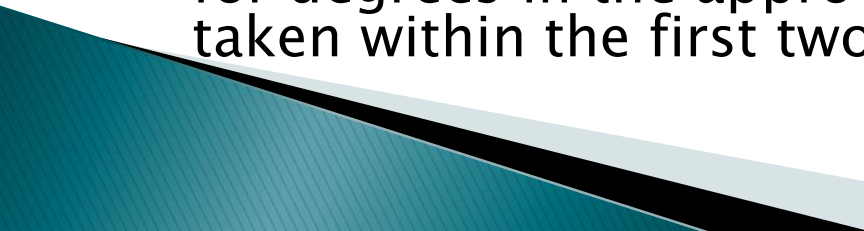
▸ Funding

The University of New Mexico STEM Gateway program is funded through a U.S. Department of Education TITLE V grant, 2011-2016 (total anticipated funding $3.82 million).

What does "gateway" mean?

Courses which meet at least one of the following criteria:

- Entry level (100 and 200 level) program-requirement courses that lead to degrees in the approved STEM disciplines

- Companion courses (labs, problem solving courses, etc) that are connected to Core Requirement or Program Requirement courses (as specified above)

- Pre-requisite courses that are required by students to take Core Requirement or Program Requirement courses (as specified above)

- Large-enrollment (>500 students/year) courses required for degrees in the approved STEM disciplines and typically taken within the first two years in the field

How do we do that?

▸ Gateway Science and Math Course Reform

Faculty-driven projects designed to change instruction and curriculum to better serve low-income and minority students. Each project team includes faculty from UNM and CNM.

How do we do that?

- **Workshops and Outreach**

Students for STEM Success (S3), a student-centered STEM Gateway initiative, that focuses on helping STEM students network and collaborate with other students, faculty, and staff who have similar academic, professional, and personal interests.

How do we do that?

▸ **Data-driven Prioritization**

Data collection and analysis to assist UNM in better understanding the course-taking patterns and success rates of UNM students and CNM transfers in relation to STEM degree attainment.

STEM Gateway Spring Symposium, 2013

How do we do that?

- **Peer Learning Facilitators (PLF)**

Peer-assisted collaborative learning activities in large gateway sections.

The assistance of facilitators allows instructors to incorporate a wider variety of effective instructional strategies.
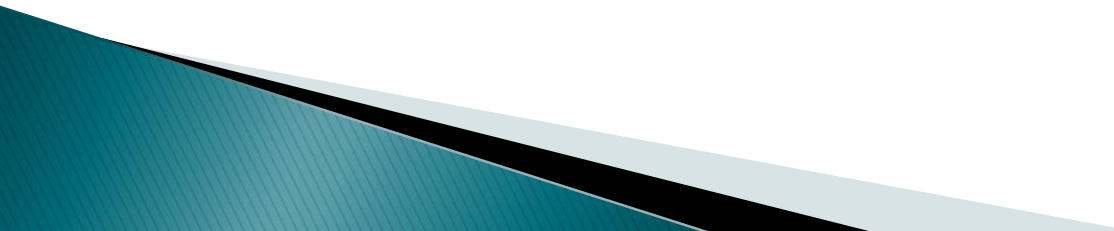
The breakdown by semester

Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014
27 PLFs	40 PLFs	42 PLFs	45 PLFs	61PLFs*
10 instructors	15 instructors	12 instructors	14 instructors	17 instructors
15 sections	23 sections	18 sections	26 sections	30 sections

Number includes 7 CEP MALL tutors

How are we assessing and evaluating?

▸ Faculty

◦ We attempted formal surveys with limited success.

◦ We now do informal inquiries via email and meeting in-person.

◦ Because we often work with the same faculty each semester, informal assessment is feasible.
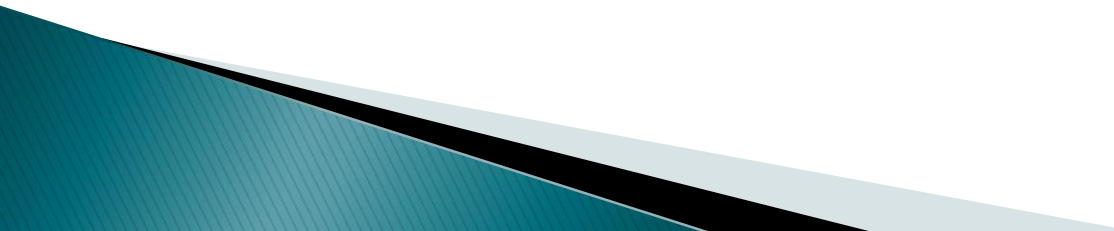
How are we assessing and evaluating?

- PLFs

  ◦ We survey the PLFs at the beginning and end of each semester, as well as once a week after training sessions.

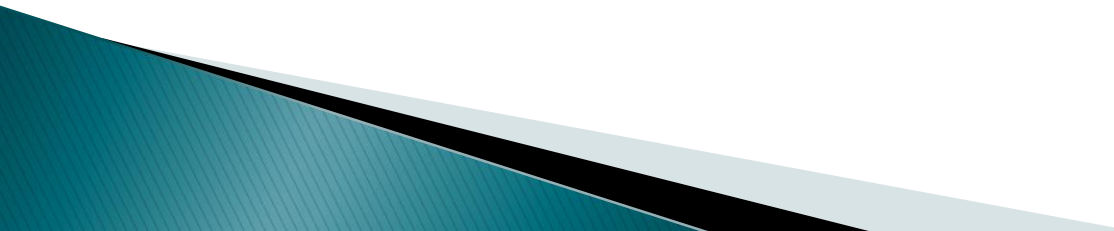 ◦ PLFs also receive feedback based on class observations.

How are we assessing and evaluating?

- Students enrolled in PLF-supported classes

  ◦ We survey the students once per semester.
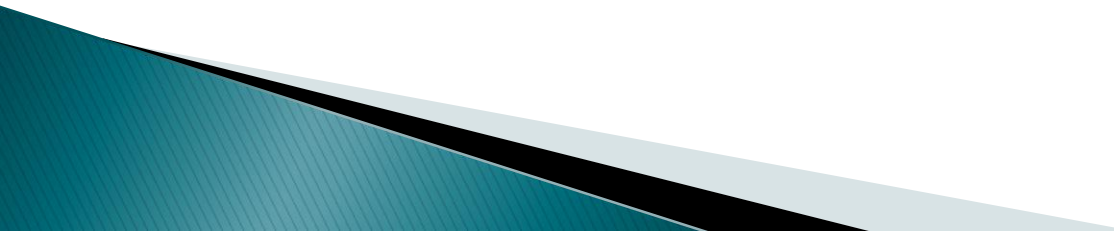
Why these types of surveys?

- Dual approach

- Grades/retention take time, need more teasing out

- For our day-to-day work, we need the immediate response that these type of surveys provide

PLF Student Surveys

1. Does working with other students in class help you learn more than you would otherwise?

   A. Yes, I learn much more when I work with other students.
   B. I don't learn more or less.
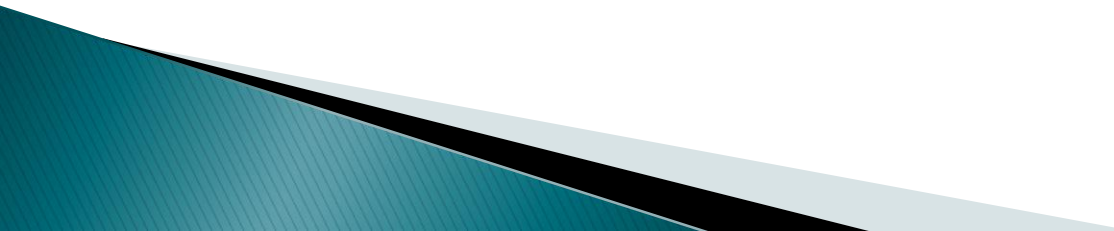   C. No I don't learn more at all.

PLF Student Surveys

2. About how many times have you asked PLFs for help during class?

      A. never
      B. 1-2 times
      C. 3-4 times
      D. 5 or more times

PLF Student Surveys

3. How many times so far this semester have you met with a PLF outside of class time?

     A. Never
     B. 1-2 times
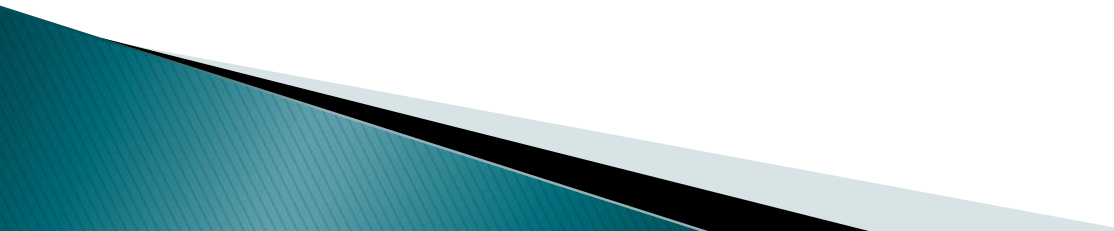   C. 3-4 times
     D. 5 or more times

PLF Student Surveys

4. In this class, how important is it for you to have a PLF available?

      A. Very important
      B. Moderately important
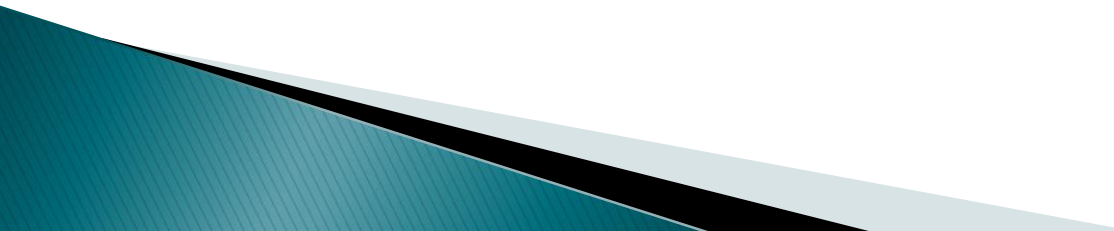   C. Not at all important

PLF Student Surveys

5. What would you do to make the PLF program better?

      A. Have more PLFs in class
      B. Have PLFs hold more/longer office hours
      C. Have the PLFs spend more time helping
          on in-class assignments
      D. Have PLFs organize and assist study
          groups outside of class time
      E. Other (suggestions):

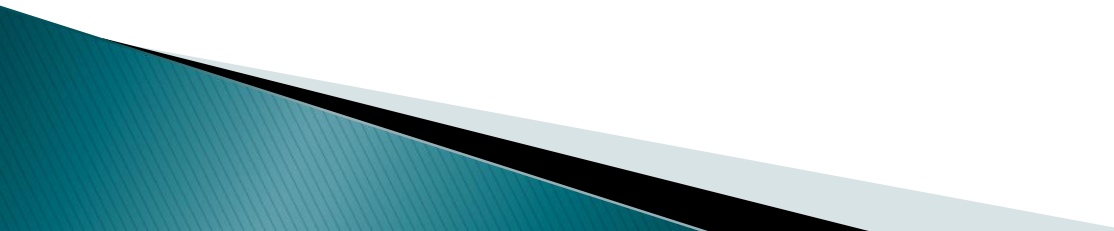# PLF Student Surveys

6. When do you feel like you get to learn the most about the material?

       A. When my instructor lectures and goes over examples

       B. When I answer iClicker questions

       C. When I work with a PLF on in-class assignments

       D. When I work with other students on in-class assignments

       E. When I visit a PLF outside of class

PLF Student Surveys

7. How were PLFs used in your class this semester?

        A. Grading Assignments
        B. Proctoring exams
        C. Taking attendance
        D. Helping with in-class assignments
        E. Holding office hours or individual tutoring sessions
        F. Holding exam review questions
        G. Other (please write in):

PLF Student Surveys
(Fall 13 additions)

8. What do you expect your final grade to be in this class?

A   B   C   D   F

9. What is your major?

Step One: Take and Tally

- Surveys are printed in hard copy.

- STEM Gateway staff schedule days to visit class based on instructor requests.

- We are in and out in 5-10 minutes.

- Student assistants then tally results.

- Instructors are given the rough numbers before the end of the semester.

Does working with other students in class help you learn more than you would otherwise?

No, I don't learn more at all. (N=61)	6.1%
I don't learn more or less. (N=222)	22.0%
Yes, I learn much more when I work with other students. (N=724)	71.9%
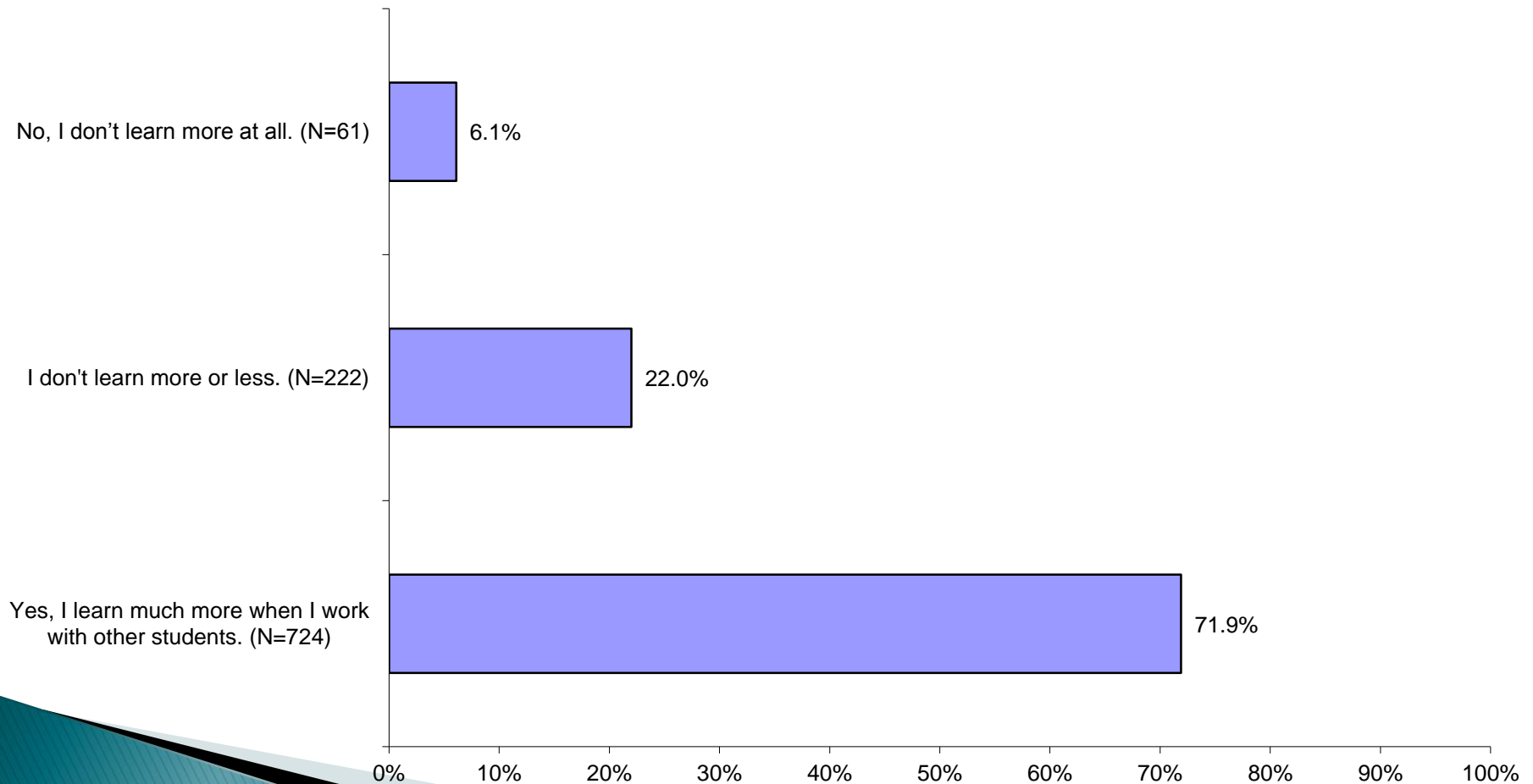
Does working with other students in class help you learn more than you would otherwise?
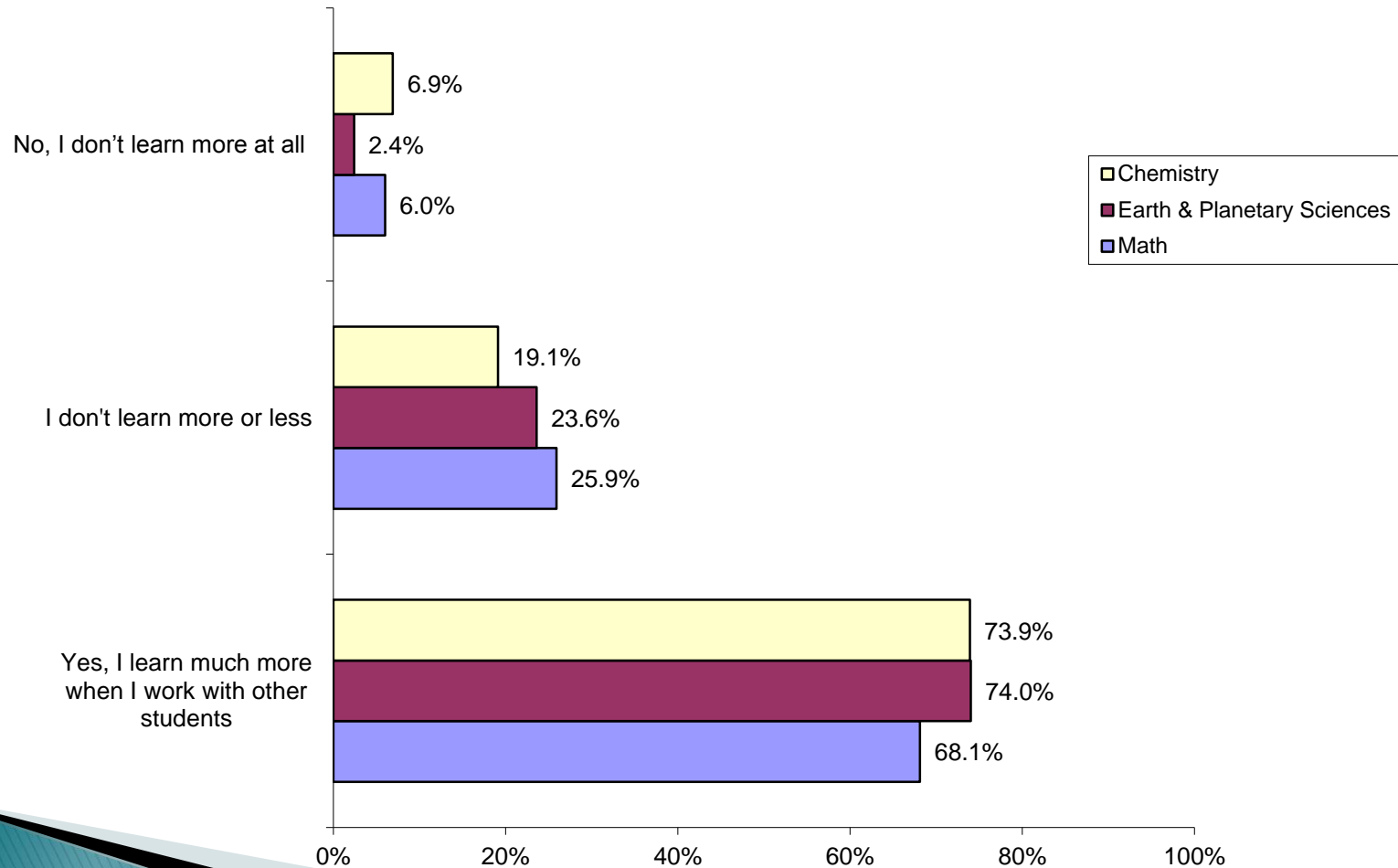
About how many times have you asked your PLFs for help during class?
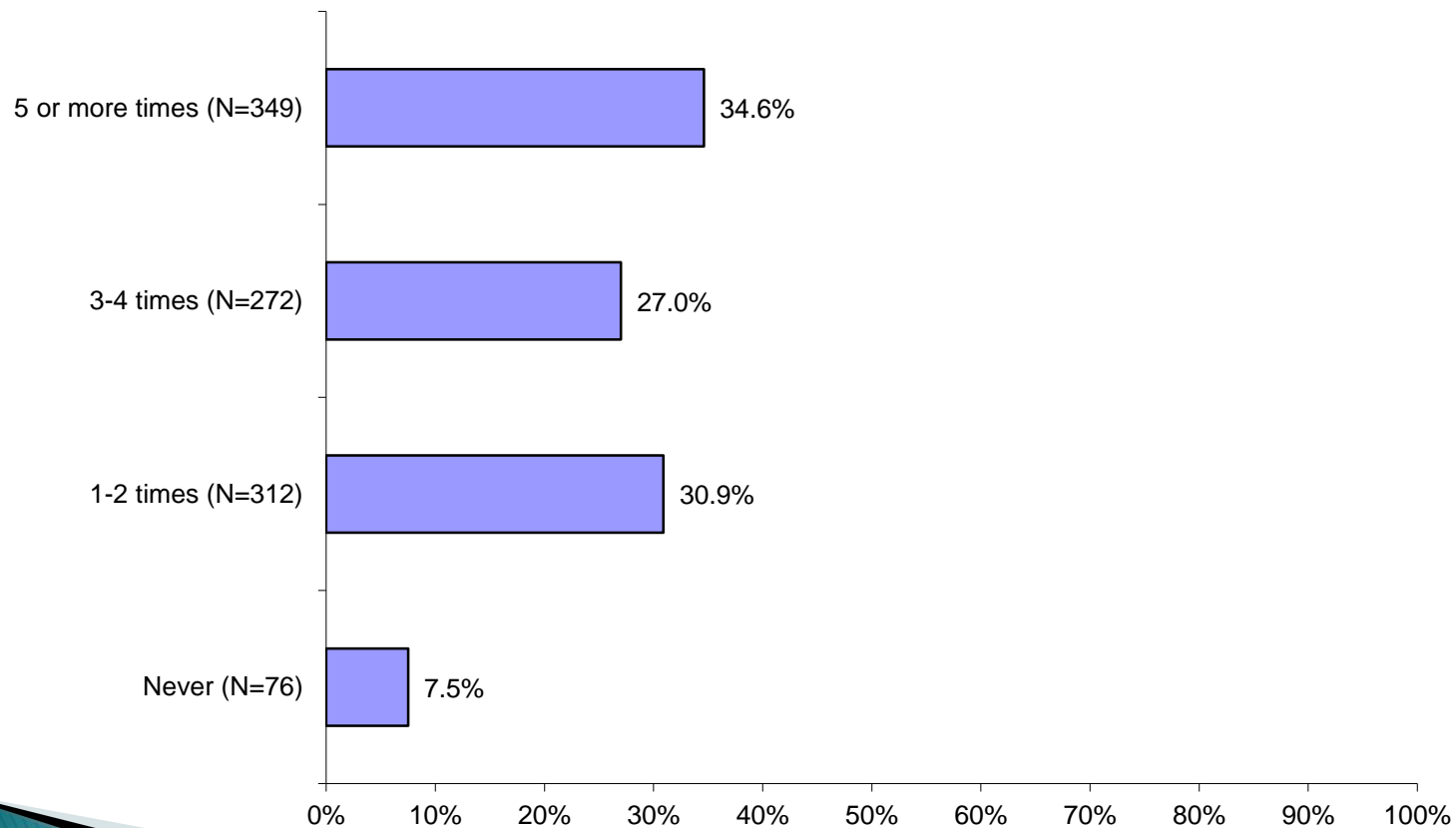
About how many times have you asked your PLFs for help during class?
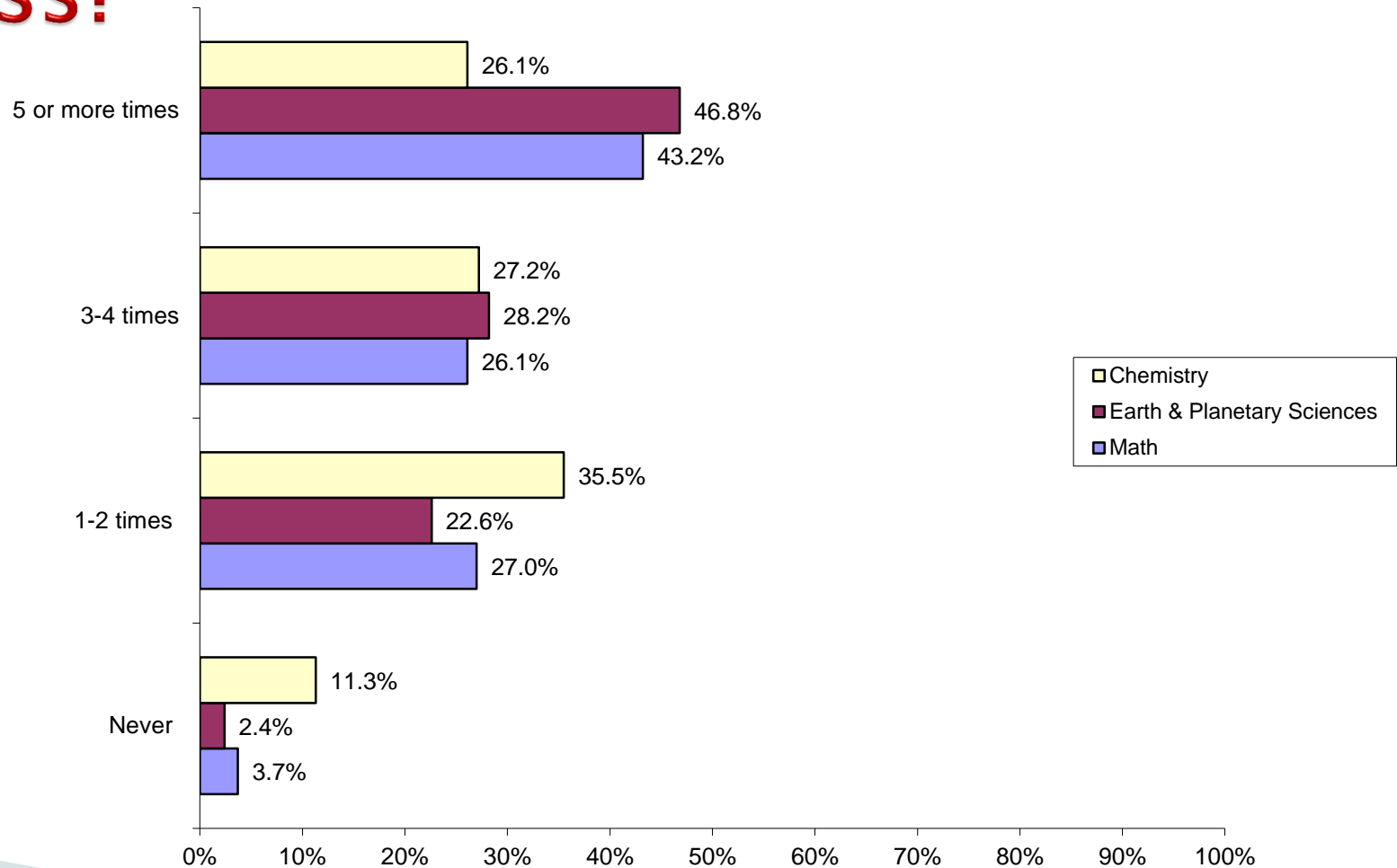
	Chemistry	Earth & Planetary Sciences	Math
5 or more times	26.1%	46.8%	43.2%
3-4 times	27.2%	28.2%	26.1%
1-2 times	35.5%	22.6%	27.0%
Never	11.3%	2.4%	3.7%

How many times so far this semester have you met with a PLF outside of class time?

Bar chart:
- 5 or more times (N=81): 8.0%
- 3-4 times (N=82): 8.1%
- 1-2 times (N=209): 20.7%
- Never (N=637): 63.1%

X-axis: 0% to 100%

How many times so far this semester have you met with a PLF outside of class time?

Chart legend:
- Chemistry
- Earth & Planetary Sciences
- Math

5 or more times
- Chemistry: 7.1%
- Earth & Planetary Sciences: 2.4%
- Math: 11.4%

3-4 times
- Chemistry: 6.6%
- Earth & Planetary Sciences: 5.6%
- Math: 11.4%

1-2 times
- Chemistry: 21.2%
- Earth & Planetary Sciences: 12.1%
- Math: 23.0%

Never
- Chemistry: 65.1%
- Earth & Planetary Sciences: 79.8%
- Math: 54.3%
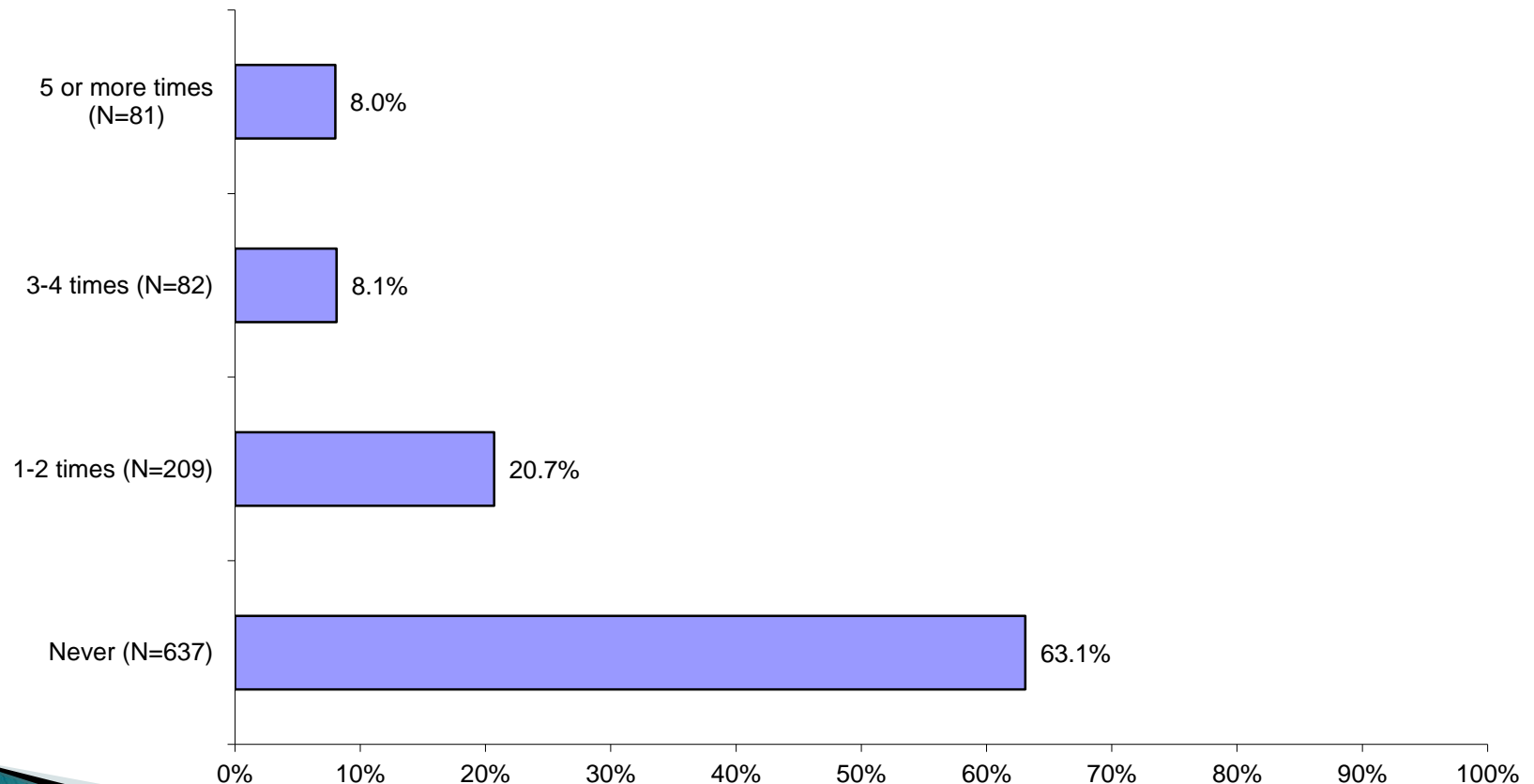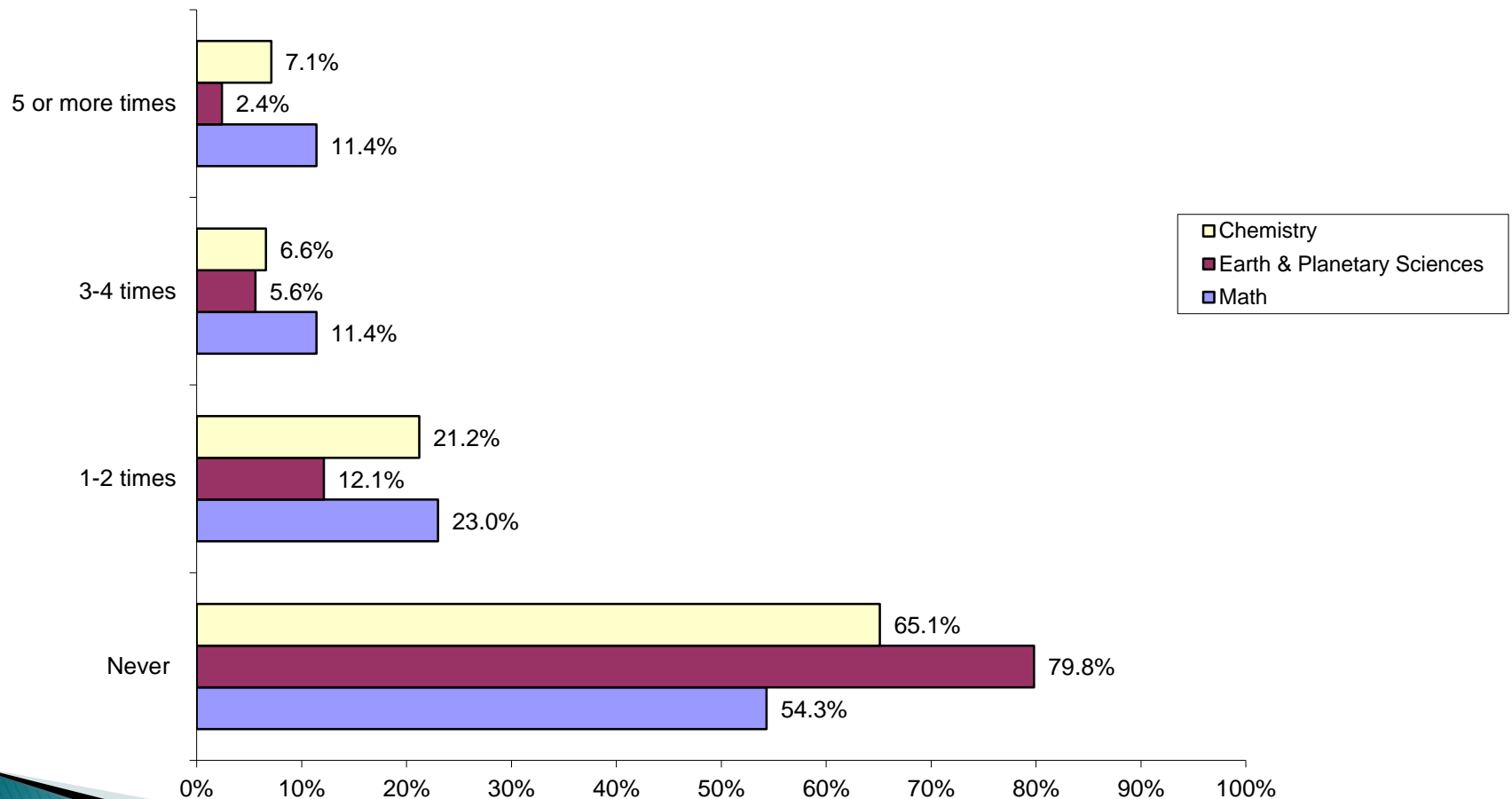
In this class, how important is it for you to have a PLF available?
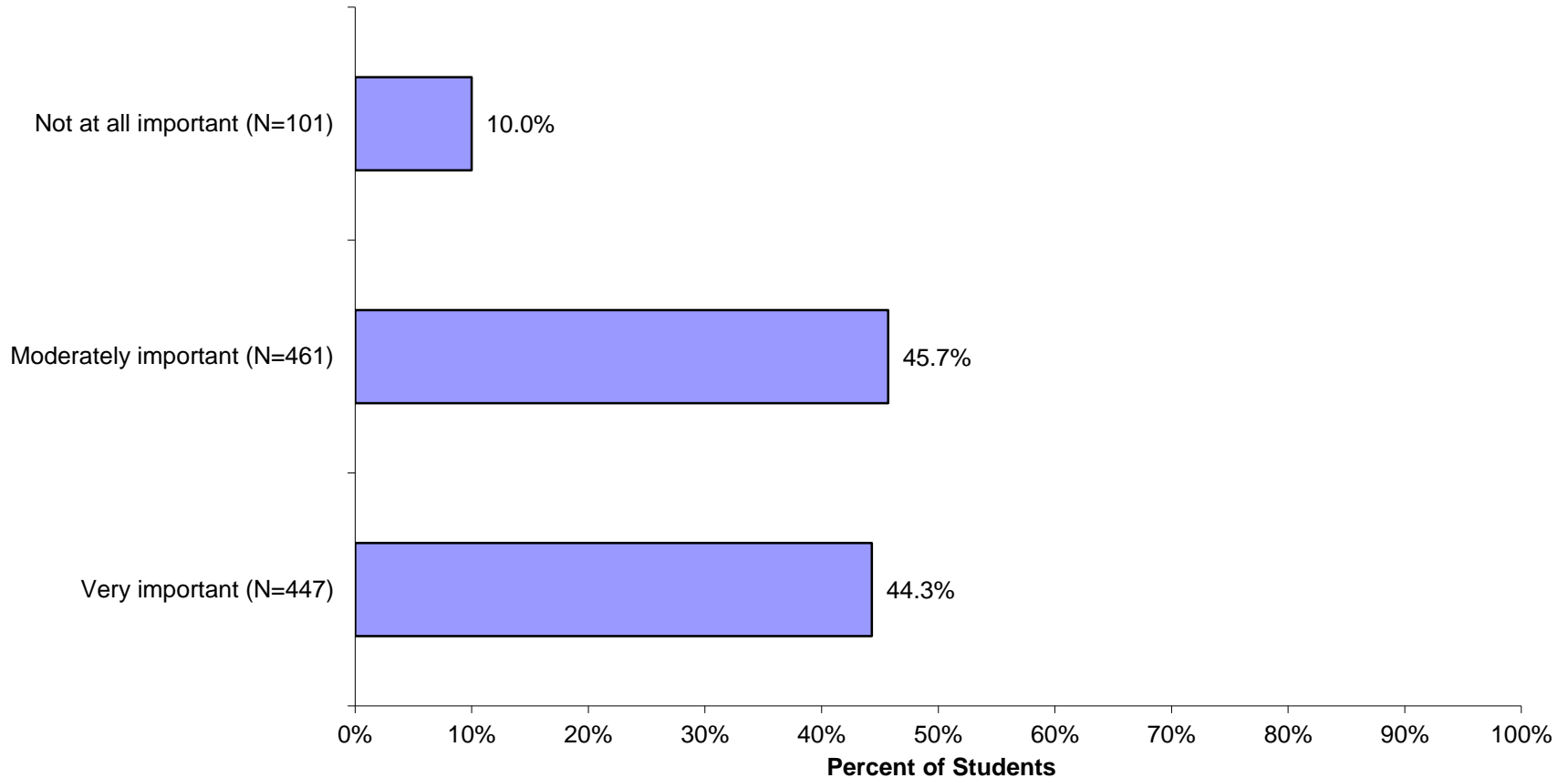
In this class, how important is it for you to have a PLF available?
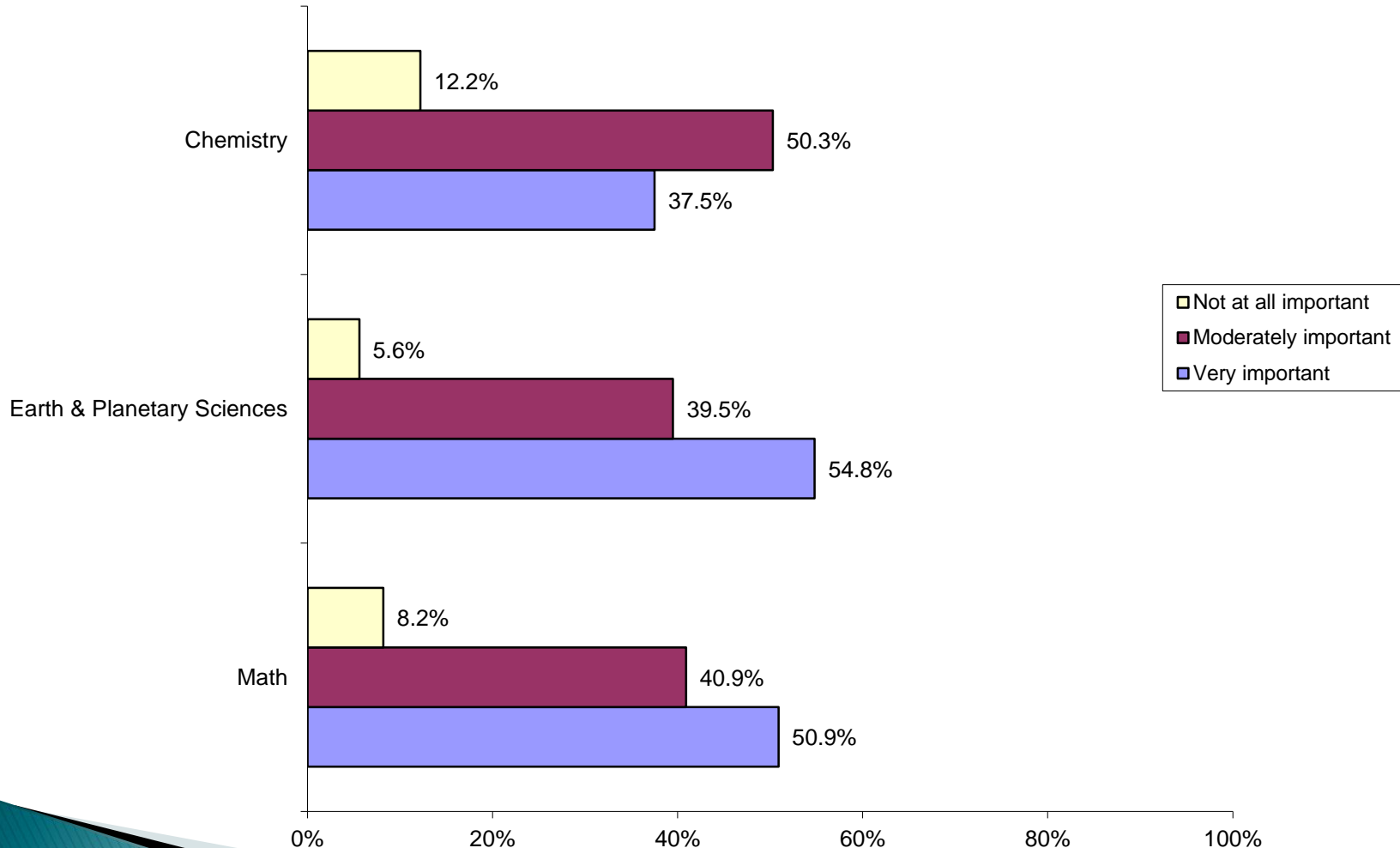
What would you do to make the PLF program better?
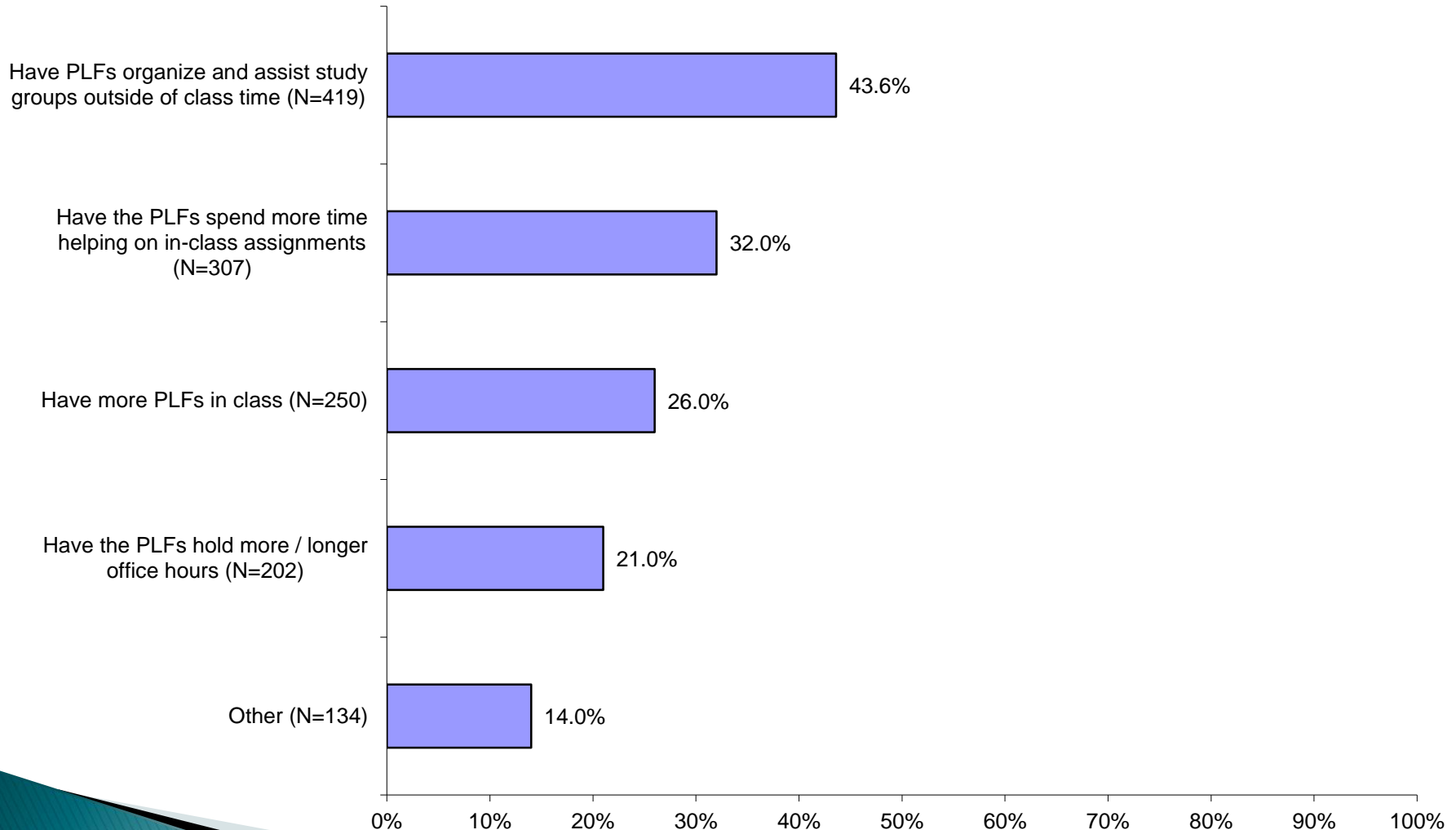
Response	Percentage
Have PLFs organize and assist study groups outside of class time (N=419)	43.6%
Have the PLFs spend more time helping on in-class assignments (N=307)	32.0%
Have more PLFs in class (N=250)	26.0%
Have the PLFs hold more / longer office hours (N=202)	21.0%
Other (N=134)	14.0%

What would you do to make the PLF program better?

Have PLFs organize and assist study groups outside of class time
- 42.8%
- 43.2%
- 45.2%

Have the PLFs spend more time helping on in-class assignments
- 33.0%
- 28.0%
- 31.8%

Have the PLFs hold more / longer office hours
- 19.7%
- 23.7%
- 22.1%

Have more PLFs in class
- 30.3%
- 29.7%
- 18.2%

Other
- 12.3%
- 12.7%
- 17.0%

Legend:
- Chemistry
- Earth & Planetary Sciences
- Math

0%   20%   40%   60%   80%   100%
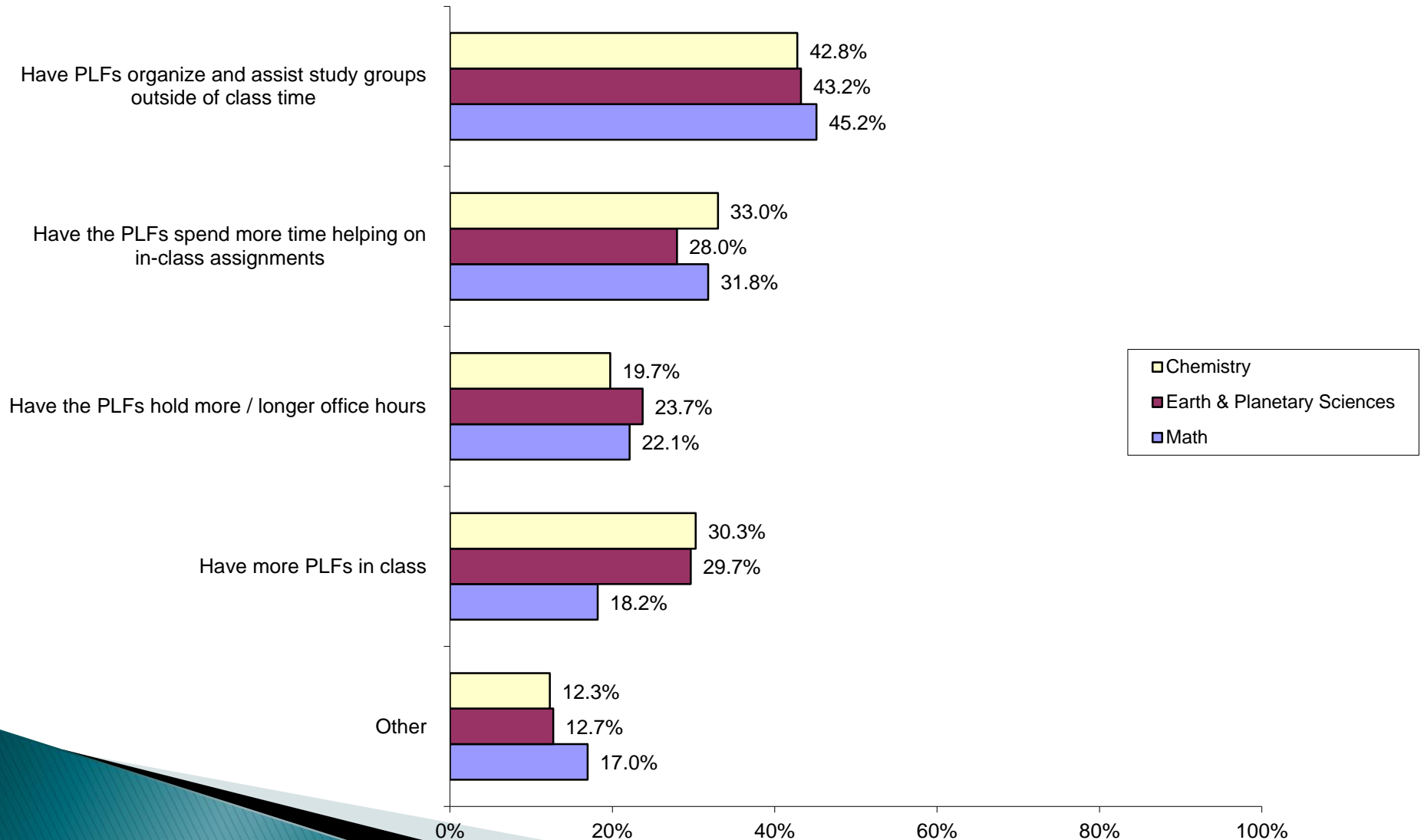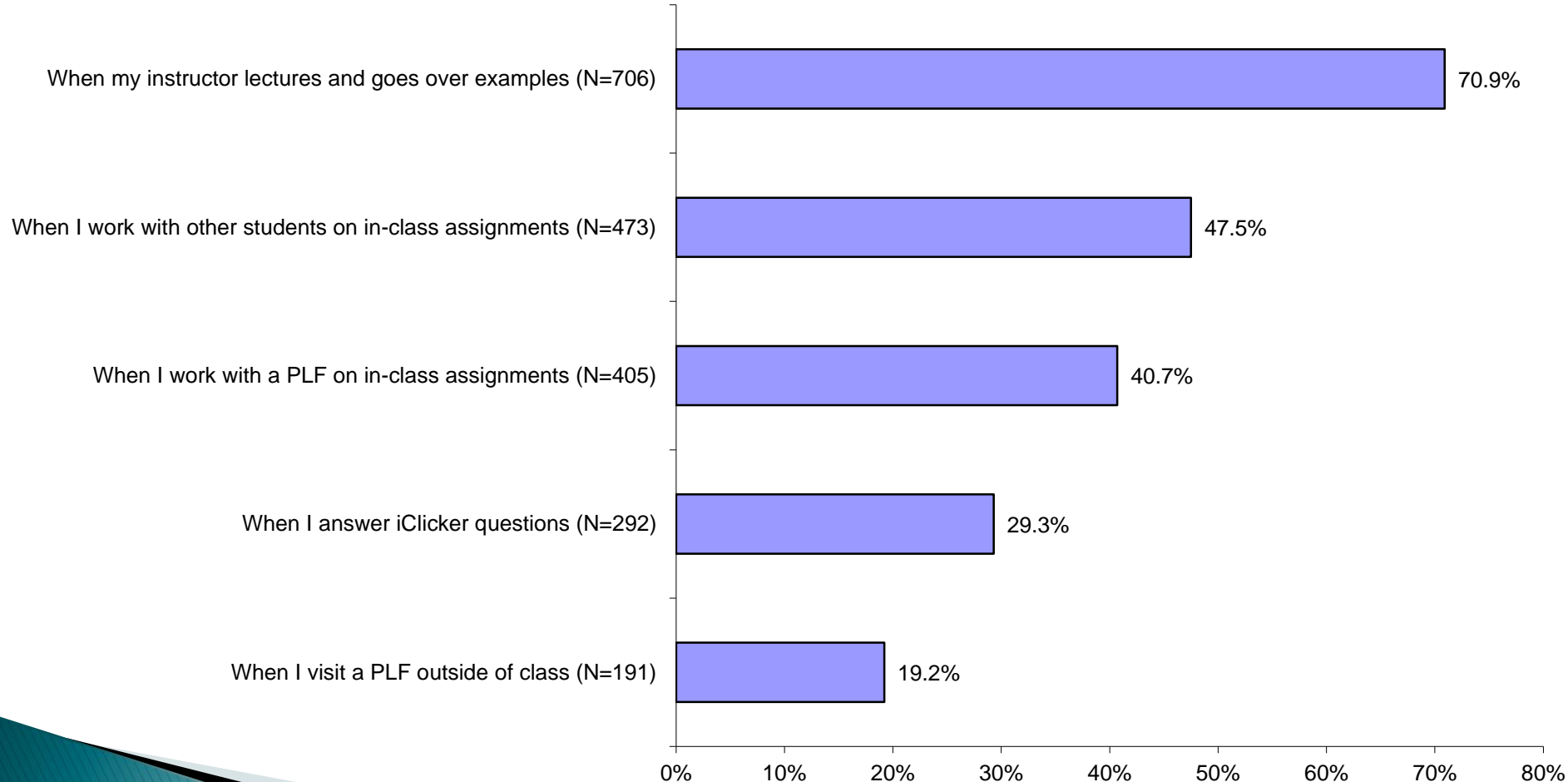
When do you feel like you get to learn the most about the material?

How were PLFs used in your class this semester?

Category	Percentage
Helping with in-class assignments (N=951)	95.1%
Holding office hours or individual tutoring sessions (N=848)	84.8%
Holding exam review sessions (N=717)	71.7%
Grading assignments (N=426)	42.6%
Proctoring exams (N=372)	37.2%
Taking attendance (N=55)	5.5%
Other (N=27)	2.7%

0%   20%   40%   60%   80%   100%

How were PLFs used in your class this semester?

Horizontal bar chart showing percentages for Chemistry, Earth & Planetary Sciences, and Math.

Category	Chemistry	Earth & Planetary Sciences	Math
Holding exam review sessions	72.7%	72.0%	70.1%
Holding office hours or individual tutoring sessions	80.0%	86.4%	91.6%
Helping with in-class assignments	94.4%	99.2%	94.8%
Taking attendance	1.1%	2.4%	13.4%
Proctoring exams	49.3%	40.8%	17.2%
Grading assignments	27.5%	72.0%	55.2%
Other	2.3%	2.4%	3.5%

Step Two: Compare and Contrast

1. Does working with other students in class help you learn more than you would otherwise?

Yes, I learn much more when I work with other students

71.9%

6. When do you feel that you learn the most about the material?

When my instructor lectures and goes over examples

70.9%

(only 42.48% said working with other students and/or PLFs)

Step Two: Compare and Contrast

3. How many times so far this semester have you met with a PLF outside of class time?

Never

63.1%

5.What would you do to make the PLF program better?

Have PLFs organize and assist study groups outside of class time

43.6%

Step Two: Compare and Contrast

4. In this class, how important is it for you to have a PLF available?

Very or Moderately Important

89.9%
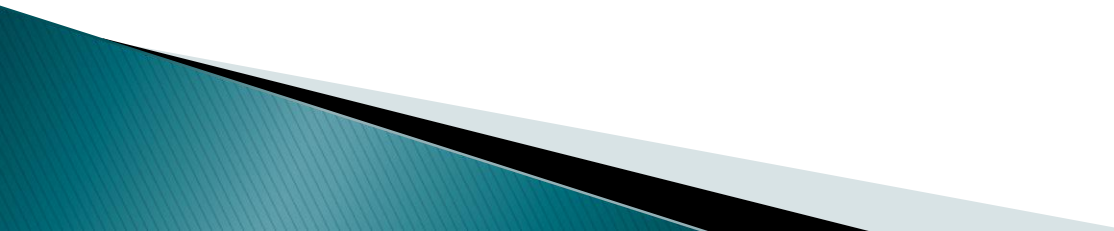
7. How were PLFs used in your class this semester?

Helping with in-class assignments

95.1%

What's working for us?

- Doing it "old school" provides huge response with many comments

- Consistent results

Problems we've faced

- Faculty participation

- Paper surveys are time-consuming to conduct and enter.

- Online survey response is much easier and faster, but can have lackluster response rates and often without comments.

Future work

- Further analyzing the data

  ◦ How do grades factor in? Majors?
  ◦ And what about breakdowns within each discipline?

- Implementation of a PLF Advisory Council

- STEM Gateway Symposium in April 2014