# Wright College Physical Science & Engineering Assessment Project Fall 2017

### WHAT?

Our project aims to learn how much collaboration is occurring in our courses. This includes student interaction with each other as well as with instructors. This is an effort to assess whether and how our classes are addressing the college-wide student learning outcome (#4): "Develop and demonstrate an understanding of ethical values, life goals, and interpersonal skills that will prepare students for life-long learning, employability, and effective citizenship." We have chosen to focus on how were are building our students' interpersonal skills.

### WHY?

The Assessment Committee of Wright College is continuing with a multiyear assessment of the college's general education student learning outcomes. The information will be used to benchmark student results for SLO #4 and allow us to develop internal targets for improvements.

## HOW?

We constructed a survey using a modified subset of questions from a survey published in *Life Sciences Education* ("Laboratory Course Assessment Survey", Corwin et al.). At the end of the Fall 2017 semester every instructor in the Physical Science & Engineering department was asked to post a link to the survey on the Blackboard site for each of their classes. (See attached SURVEY.)

## WHAT WE FOUND

In our department, a total of 237 students provided responses to the survey. The sample is not truly random since it favors classes whose instructors pushed the survey and students who frequented Blackboard. However, the survey responses show that every or nearly every course was covered (including chemistry, physics, astronomy, and physical science), though physics classes had a very low response rate. (See attached DATA.)

# Key findings:

- Most students (69%) claimed that they discussed aspects of the course with their classmates or instructor at least weekly. Only 5% said they had never discussed the course or did not know if they had. Our department seems to be pretty solid on this point.
- Only 42% claimed that they contributed their ideas and suggestions during class discussions at least once a week. On the other hand, just 16.5% claimed that they never contributed or did not know if they did.
- A majority (56.5%) claimed to help other students collect or analyze data at least once a week (unsurprisingly higher for most lab courses). Only 10% said they never did this or did not know (mostly from non-lab courses).
- About half (47%) claimed that they provided constructive criticism to classmates and challenged each other's interpretations at least once a week. A relatively high 23% of students never did this or did not know if they had. <u>This might be</u> an area to seek improvement since collaborative problem-solving is at the heart of modern science.
- About half (48%) claimed they had shared problems they encountered and sought input at least once a week. Only 13% claimed they never did or did not know if they did.
- "Never" answers were notably higher for non-lab courses such as PhySci101 and Astro201. Phys235 shows an unusually high percentage as well, but only 9 students from this course took the survey.

• For some courses, the statistics are too low to draw coursespecific conclusions (e.g. Chem203, Chem212, Phys236, Phys237).



SURVEY (re: collaboration and interpersonal skills)

In this course, I discussed aspects of this course with classmates or the instructor.

(a) Never

(b) One or two times

(c) At least weekly

(d) I don't know

In <u>this</u> course, I contributed my ideas and suggestions during class discussions.

(a) Never

(b) One or two times

(c) At least weekly

(d) I don't know

In <u>this</u> course, I helped other students collect or analyze data.

(a) Never

(b) One or two times

(c) At least weekly

(d) I don't know

In <u>this</u> course, I provided constructive criticism to classmates and we challenged each other's interpretations.

(a) Never

(b) One or two times

(c) At least weekly

(d) I don't know

In <u>this</u> course, I shared the problems I encountered during my readings and sought input on how to address them.

(a) Never

(b) One or two times

(c) At least weekly

(d) I don't know

Astro201 Never 10.0% 17.5% 17.5% 22.5% 20.0%   Total: 40 One or two times 25.0% 37.5% 37.5% 37.5% 37.5% 50.0%   At least weekly 57.5% 45.0% 40.0% 30.0% 25.0%   Chem121 Never 0.0% 14.3% 0.0% 14.3% 10.7%   Total: 28 One or two times 39.3% 50.0% 28.6% 28.6% 32.1%   At least weekly 60.7% 35.7% 71.4% 53.6% 53.6%   I don't know 0.0% 0.0% 0.0% 62.5% 59.7%   Total: 72 Never 1.4% 11.1% 0.0% 69.9% 2.8%   Total: 72 One or two times 16.7% 38.9% 29.2% 26.4% 36.1%   At least weekly 80.6% 44.4% 70.8% 62.5% 59.7%   I don't know 1.4% 5.6% 0.0% 4.2% 1.4%   Chem203 Never 0.	DATA		l discussed aspects of this course with classmates or the instructor.	I contributed my ideas and suggestions during class discussions.	I helped other students collect or	I provided constructive criticism to classmates and we challenged each other's	I shared the problems I encountered during my readings and sought input on how to address them.
At least weekly I don't know 57.5% 7.5% 45.0% 0.0% 40.0% 5.0% 30.0% 10.0% 25.0% 5.0%   Chem121 Total: 28 Never At least weekly I don't know 0.0% 0.0% 14.3% 50.0% 0.0% 28.6% 14.3% 28.6% 10.7% 32.1%   Chem201 Total: 72 Never One or two times At least weekly I don't know 1.4% 16.7% 11.1% 38.9% 0.0% 29.2% 26.4% 26.4% 36.1% 36.1%   Chem201 Total: 72 Never One or two times At least weekly I don't know 16.7% 38.9% 29.2% 29.2% 26.4% 36.1% 36.1% 36.1%   Chem203 Total: 6 Never One or two times At least weekly I don't know 0.0% 0.0% 16.7% 16.7% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	Astro201	Never			-		
I don't know 7.5% 0.0% 5.0% 10.0% 5.0%   Chem121 Total: 28 Never One or two times At least weekly I don't know 39.3% 60.7% 50.0% 35.7% 28.6% 71.4% 28.6% 53.6% 32.1% 53.6%   Chem201 Total: 72 Never One or two times At least weekly I don't know 1.4% 16.7% 11.1% 38.9% 0.0% 29.2% 26.4% 26.4% 36.1% 36.1%   Chem201 Total: 72 Never One or two times At least weekly I don't know 0.0% 16.7% 16.7% 50.0% 16.7% 16.7% 33.3% 83.3% 83.3% 83.3% 83.3% 83	Total: 40	One or two times	25.0%	<b>б</b> 37.5%	37.5%	37.5%	50.0%
Chem121 Total: 28 Never One or two times At least weekly I don't know 0.0% 39.3% 60.7% 0.0% 14.3% 50.0% 35.7% 0.0% 0.0% 28.6% 28.6% 71.4% 14.3% 28.6% 53.6% 10.7% 28.6% 53.6%   Chem201 Total: 72 Never One or two times At least weekly I don't know 1.4% 16.7% 11.1% 38.9% 0.0% 6.9% 2.8% 2.8% 36.1%   Chem201 Total: 72 Never One or two times At least weekly I don't know 16.7% 1.4% 38.9% 29.2% 26.4% 26.4% 36.1% 36.1%   Chem203 Total: 6 Never One or two times At least weekly I don't know 0.0% 16.7% 16.7% 50.0% 0.0% 16.7% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%		At least weekly	57.5%	<i>б</i> 45.0%	40.0%	30.0%	25.0%
Total: 28 One or two times At least weekly I don't know 39.3% 60.7% 0.0% 50.0% 35.7% 0.0% 28.6% 71.4% 0.0% 28.6% 53.6% 53.6% 32.1% 53.6% 53.6%   Chem201 Never 1.4% 11.1% 0.0% 0.0% 6.9% 29.2% 26.4% 26.4% 36.1% 36.1%   Total: 72 One or two times At least weekly I don't know 16.7% 80.6% 38.9% 44.4% 29.2% 70.8% 26.4% 62.5% 36.1% 59.7%   Chem203 Never 0.0% 0.0% 16.7% 16.7% 0.0% 0.0% 0.0%   Chem203 Never 0.0% 0.0% 16.7% 16.7% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%		l don't know	7.5%	6 0.0%	5.0%	10.0%	5.0%
Total: 28 One or two times At least weekly I don't know 39.3% 60.7% 0.0% 50.0% 35.7% 0.0% 28.6% 71.4% 0.0% 28.6% 53.6% 53.6% 32.1% 53.6%   Chem201 Never 1.4% 11.1% 16.7% 0.0% 6.9% 29.2% 26.4% 26.4% 36.1% 36.1%   Total: 72 One or two times At least weekly I don't know 16.7% 16.7% 38.9% 29.2% 29.2% 26.4% 26.4% 36.1%   Chem203 Never 0.0% 0.0% 14.4% 70.8% 62.5% 59.7% 59.7%   I don't know 1.4% 5.6% 0.0% 16.7% 16.7% 1.4%   Chem203 Never 0.0% 16.7% 16.7% 50.0% 16.7% 16.7% 16.7%   Total: 6 One or two times At least weekly 100.0% 0.0% 0.0% 0.0% 0.0%   Onew 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%							
Total: 28 One or two times At least weekly I don't know 39.3% 60.7% 0.0% 50.0% 35.7% 0.0% 28.6% 71.4% 0.0% 28.6% 53.6% 53.6% 32.1% 53.6% 53.6%   Chem201 Never 1.4% 11.1% 0.0% 0.0% 6.9% 29.2% 26.4% 26.4% 36.1% 36.1%   Total: 72 One or two times At least weekly I don't know 16.7% 80.6% 38.9% 44.4% 29.2% 70.8% 26.4% 62.5% 36.1% 59.7%   Chem203 Never 0.0% 0.0% 16.7% 16.7% 0.0% 0.0% 0.0%   Chem203 Never 0.0% 0.0% 16.7% 16.7% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	Chem121	Never	0.0%	<i>.</i> 14.3%	0.0%	14.3%	10.7%
At least weekly I don't know 60.7% 0.0% 35.7% 0.0% 71.4% 0.0% 53.6% 53.6% 53.6% 53.6%   Chem201 Total: 72 Never One or two times At least weekly I don't know 1.4% 16.7% 11.1% 38.9% 0.0% 29.2% 66.9% 26.4% 2.8% 36.1%   Chem201 Total: 72 Never At least weekly I don't know 16.7% 1.4% 38.9% 29.2% 26.4% 26.4% 36.1% 36.1%   Chem203 Total: 6 Never One or two times At least weekly 100.0% 0.0% 16.7% 16.7% 50.0% 0.0% 16.7% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%							
I don't know 0.0% 0.0% 0.0% 3.6% 3.6%   Chem201 Total: 72 Never One or two times At least weekly I don't know 1.4% 11.1% 0.0% 6.9% 2.8%   Chem203 Total: 6 Never Never 16.7% 38.9% 29.2% 26.4% 36.1%   Chem203 Total: 6 Never One or two times 16.7% 56% 0.0% 4.2% 1.4%   Chem203 Total: 6 Never One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   Chem203 Total: 6 Never One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   At least weekly I don't know 100.0% 83.3% 33.3% 83.3% 83.3%   I don't know 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%							
Total: 72 One or two times At least weekly 16.7% 38.9% 29.2% 26.4% 36.1%   At least weekly 80.6% 44.4% 70.8% 62.5% 59.7%   I don't know 1.4% 5.6% 0.0% 4.2% 1.4%   Chem203 Never 0.0% 0.0% 16.7% 0.0% 0.0%   Total: 6 One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   At least weekly 100.0% 83.3% 33.3% 83.3% 83.3%   I don't know 0.0% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%							
Total: 72 One or two times At least weekly 16.7% 38.9% 29.2% 26.4% 36.1%   At least weekly 80.6% 44.4% 70.8% 62.5% 59.7%   I don't know 1.4% 5.6% 0.0% 4.2% 1.4%   Chem203 Never 0.0% 0.0% 16.7% 0.0% 0.0%   Total: 6 One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   At least weekly 100.0% 83.3% 33.3% 83.3% 83.3%   I don't know 0.0% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%							
At least weekly I don't know 80.6% 1.4% 44.4% 5.6% 70.8% 0.0% 62.5% 4.2% 59.7% 1.4%   Chem203 Total: 6 Never One or two times At least weekly I don't know 0.0% 0.0% 0.0% 16.7% 0.0% 50.0% 0.0% 16.7% 0.0% 83.3% 0.0% 83.3% 0.0% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	Chem201	Never	1.4%	6 11.1%	0.0%	6.9%	2.8%
I don't know 1.4% 5.6% 0.0% 4.2% 1.4%   Chem203 Total: 6 Never 0.0% 0.0% 16.7% 0.0% 0.0%   Total: 6 One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   At least weekly 100.0% 83.3% 33.3% 83.3% 83.3%   I don't know 0.0% 0.0% 0.0% 0.0% 0.0%	Total: 72	One or two times	16.7%	<b>38.9</b> %	29.2%	26.4%	36.1%
Chem203 Never 0.0% 0.0% 16.7% 0.0% 0.0%   Total: 6 One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   At least weekly 100.0% 83.3% 33.3% 83.3% 83.3%   I don't know 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%		At least weekly	80.6%	<i>б</i> 44.4%	70.8%	62.5%	59.7%
Total: 6 One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   At least weekly 100.0% 83.3% 33.3% 83.3% 83.3% 83.3% 0.0% <td></td> <td>l don't know</td> <td>1.4%</td> <td>5.6%</td> <td>0.0%</td> <td>4.2%</td> <td>1.4%</td>		l don't know	1.4%	5.6%	0.0%	4.2%	1.4%
Total: 6 One or two times 0.0% 16.7% 50.0% 16.7% 16.7%   At least weekly 100.0% 83.3% 33.3% 83.3% 83.3% 83.3% 0.0% <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
At least weekly I don't know 100.0% 83.3% 33.3% 83.3% <t< td=""><td>Chem203</td><td>Never</td><td>0.0%</td><td>6.0%</td><td>16.7%</td><td>0.0%</td><td>0.0%</td></t<>	Chem203	Never	0.0%	6.0%	16.7%	0.0%	0.0%
I don't know 0.0% 0.0% 0.0% 0.0% 0.0%   Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0% 0.0%	Total: 6	One or two times	0.0%	6 16.7%	50.0%	16.7%	16.7%
Chem212 Never 0.0% 0.0% 0.0% 0.0% 0.0%		At least weekly	100.0%	6 83.3%	33.3%	83.3%	83.3%
		I don't know	0.0%	6 0.0%	0.0%	0.0%	0.0%
	Chem212	Never	0.0%	6 0.0%	0.0%	0.0%	0.0%
Iotal: 5 Une or two times 0.0% 60.0% 40.0% 60.0% 40.0%	Total: 5	One or two times	0.0%	60.0%	40.0%	60.0%	40.0%
At least weekly 100.0% 40.0% 60.0% 20.0% 60.0%		At least weekly	100.0%	6 40.0%	60.0%	20.0%	60.0%
I don't know 0.0% 0.0% 0.0% 0.0% 0.0%		l don't know	0.0%	6 0.0%	0.0%	20.0%	0.0%

PhySci101 Total: 45	Never One or two times At least weekly I don't know	4.4% 35.6% 60.0% 0.0%	20.0% 46.7% 24.4% 8.9%	17.8% 46.7% 31.1% 4.4%	22.2% 24.4% 40.0% 13.3%	17.8% 42.2% 35.6% 4.4%
PhySci111 Total: 16	Never One or two times At least weekly I don't know	0.0% 31.3% 68.8% 0.0%	0.0% 62.5% 37.5% 0.0%	0.0% 37.5% 62.5% 0.0%	18.8% 31.3% 43.8% 6.3%	0.0% 56.3% 43.8% 0.0%
Phys221 Total: 13	Never One or two times At least weekly I don't know	0.0% 15.4% 84.6% 0.0%	7.7% 23.1% 69.2% 0.0%	0.0% 15.4% 84.6% 0.0%	15.4% 30.8% 46.2% 7.7%	7.7% 15.4% 76.9% 0.0%
Phys235 Total: 9	Never One or two times At least weekly I don't know	11.1% 44.4% 44.4% 0.0%	11.1% 33.3% 55.6% 0.0%	22.2% 22.2% 55.6% 0.0%	33.3% 44.4% 22.2% 0.0%	22.2% 33.3% 44.4% 0.0%
Phys236 Total: 1	Never One or two times At least weekly I don't know	0.0% 0.0% 100.0% 0.0%	0.0% 0.0% 100.0% 0.0%	0.0% 0.0% 100.0% 0.0%	0.0% 100.0% 0.0% 0.0%	0.0% 0.0% 100.0% 0.0%
Phys237 Total: 2	Never One or two times At least weekly I don't know	50.0% 0.0% 50.0% 0.0%	50.0% 50.0% 0.0% 0.0%	50.0% 0.0% 50.0% 0.0%	50.0% 0.0% 0.0% 50.0%	50.0% 50.0% 0.0% 0.0%
ALL Total: 237	Never One or two times At least weekly I don't know	3.8% 25.3% 69.2% 1.7%	13.1% 41.8% 41.8% 3.4%	8.0% 33.8% 56.5% 1.7%	15.6% 30.0% 46.8% 7.6%	10.5% 38.8% 48.1% 2.5%