Democratic Syllabi:
Increasing student buy-in

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Rochester Institute of Technology
College of Science
Department of Chemistry
FLC Class of 2008

Teaching Philosophy:

I am the Riddler.

My voice substitutes for the student's internal monologue, teaching them to ask themselves the questions that lead to finding their own answers rather than relying on the answers I provide. In the end, I believe that asking good questions is always better than having a great answer.

My Project:

- Service courses notoriously have poor student appreciation of goals. Lack of acceptance leads to diminished motivation and diminished effort.
- By negotiating the structure of the course with the students, I hoped to get the students to embrace the goals and methods of the course. Students were surveyed on motivation before and after the course, results were compared.

The course demographics:

General & Analytical Chemistry III - This was the 3rd quarter of the introductory chemistry sequence for engineers and non-chemistry science majors.

70 mostly first year students.

Original Course Structure (see attached syllabus):

Online homework: 4-5 per week, 79 total questions
Exams: 3 hourly exams + Final exam. Lowest exam score was dropped.
Quizzes: Weekly on myCourses.
Attendance: mandatory, monitored by clickers.
Clicker Questions: bonus questions daily based on problem-solving, comprehension.
Lectures: 80% MS-Powerpoint

Student Preferred Structure (in-class clicker survey):

Online homework:

40% wanted daily assignments
60% wanted 1 weekly assignment
0% wanted no homework

Exams:

56% wanted 3 exams + final

31% didn't care how many as long as 1 dropped
13% wanted fewer than 3 exams

Quizzes:

21% wanted no weekly quizzes
45% wanted Multiple Choice only quizzes

Attendance:

68% wanted mandatory attendance
25% wanted optional attendance

Clickers:

98% liked the clickers & clicker points

Lectures:

40% wanted Powerpoint
34% wanted Powerpoint but with more solved problems
9% disliked Powerpoint

Results of Pre-class and Post-class survey (see appendix for full results):

Online Homework:

65% found it helpful vs. 55% in Chem II
9% found it useless vs. 3%
5% found it took too much time vs. 17%
40% felt it hurt their grade vs 20%
52% felt it helped their grade vs 50%

Clicker Questions:

74% found it helpful vs. 64%

Course

52% would recommend vs. 53%
7.5% would recommend against vs 10.5%
78% felt rules were fair and clear vs. 71%
15% were more satisfied than Chem II
7% were more dissatisfied than Chem II

Conclusions:

The surveys were inconclusive. This was not unexpected after the negotiation of the syllabus since the negotiating clearly favored maintaining the existing course structure form Chem II. This was an interesting, if not completely surprising occurrence: a student population that is notoriously dissatisfied with the course chose to change almost nothing about the course when given the opportunity to do so. This seems to argue that, from a student perspective, all change is bad and they prefer the devil they know to the one they don't know.

I intend to try the experiment again next year, starting with a Chem I population that is not biased toward an existing course structure and see how the student

satisfaction in the Fall 2009 group compares to student satisfaction from previous years.

Overall, my FLC experience was WONDERFUL. To have an opportunity to dedicate some time to talking to RIT colleagues about pedagogical issues and to spend 3 days at the Lilly Conference hearing from colleagues around the globe was an incredible experience. While the changes in my teaching and feelings about my teaching may not be immediately obvious, the entire year has given me a framework within which it is not only safe to experiment but necessary. My journey is not complete, even though my FLC experience is over, but my journey is well begun.

APPENDIX:
Supporting Documents

Syllabus for General & Analytical Chemistry II:

The prerequisite for the course in which I conducted this experiment.

SCH-1011-216 GENERAL & ANALYTICAL CHEMISTRY II

Winter 08

INSTRUCTOR: Dr. Joe Lanzafame
Office: 08-A256 Phone: x5-7471 E-Mail: jmlsch@rit.edu
Web Site: www.chemgod.com

Office Hours: MF 9:00-10:00 a.m., TR 10:30-12:00 p.m. or by appointment.

TEXTS: Nivaldo Tro, ***Chemistry: A Molecular Approach***

COURSE OUTLINE:

Objective: Present college chemistry as a science based on empirical evidence that is placed into the context of conceptual, visual and mathematical models. Students will learn the concepts, symbolism and fundamental tools of chemistry necessary to carry on a discussion of chemistry. Emphasis will be placed on the relationship between atomic structure, chemical bonds and the transformation of these bonds through chemical reactions.

Throughout the course you will gain some important skills. These include:

- Dimensional analysis & unit conversion
- Basics of chemical nomenclature
- Balancing chemical equations
- Solving limiting reagent problems
- Chemical logic – Qualitative Analysis
- Use of the Periodic Table to predict behavior
- Working with moles, molar mass, and molarity

Schedule: Class will meet twice per week. In addition, all students should be registered for the 1-credit laboratory course, Chemical Principles II (1011-206) which meets for one 3-hour session each week. The lab is independent of the course and graded COMPLETELY separately.

Lecture notes will be available on the web site for the course. Readings for the lectures are indicated in the schedule given below; a copy of this syllabus will be available on myCourses. It is generally helpful to skim the reading assignment before lecture and attempt the pre-class problem, without worrying about understanding everything. After lecture, the material should be reexamined to clarify your questions and the post-class problems solved.

Exam dates will be finalized later. The dates on the accompanying course schedule are tentative

COURSE ASSESSMENT:

Exams (3 hourly + 1 final – lowest dropped):	300 points
Homework/Attendance:	100 points
Weekly Quizzes:	100 points
Total available points:	500 points

Your progress through the course will be assessed using exams, homework/quizzes, and in-class responses. Three exams will be given throughout the quarter, and one Final (finals week) – the lowest of the FOUR exams is dropped. Each exam will account for 100 points. You will also be assessed based on weekly homework/quizzes. The cumulative homework/quiz score will account for 100 points.

The final grade for the course will be based on the scale given below.

Points	Grade
450 or better	A
400 – 449	B
350 – 399	C
300 – 349	D
299 or below	F

Homework/Attendance: Homework will be collected through the www.masteringchemistry.com website. The log-in information came with your textbook. The course ID for this particular class is "CHEM215FALL2008". Homework assignments are assigned on a daily basis. There is a pre-class and a post-class assignment for each lecture (except exams and review days). The problems come directly from the even-numbered questions in your text. There is a corresponding odd-numbered question that is very similar and has the answer in the Appendix at the back of the book.

These problem sets will help you understand my emphasis in the course. More importantly, the homework will guide you in the practice of chemistry. Practice is crucial to perform well in a quantitative, problem-oriented discipline such as chemistry. The schedule of topics is laid out in the accompanying "course schedule" and includes reading assignments from the book that correlate to the problems. Homework can be COLLABORATED UPON, so you may work in teams.

Each pre-class assignment is due by midnight of the day before class. Each Tuesday post-class assignment is due by Friday midnight. Each Thursday post-class assignment is due by Monday midnight before the following class.

The total number of problems/points on the electronic homework is 80 points.

I will also be using the "clickers" to take daily attendance worth another 20 points, for a total of 100 homework/attendance points. It should be EASY to get 80-90 of these points and it would be a shame to throw them away for either not doing the assignments or skipping class.

BONUS CLICKER POINTS: There will also be questions asked in class for which you will get bonus points (not included in the 500 points above). I expect that there will be 20-30 such opportunities during the semester and these just get added to your grade.

IT IS POSSIBLE FOR ONE PERSON TO OPERATE MULTIPLE CLICKERS, so you could click-in for your friends while they are sleeping. This would constitute fraud and if I catch anyone with more than 1 clicker in class, I will eliminate all attendance points and clicker points for the entire semester for all parties involved. There is no leniency for this and the penalty will attach to the FIRST such incident. (Losing the attendance points will likely result in a 1 letter grade penalty at the end of the quarter.) A second incident will result in an automatic "F" for the entire course and possibly referral to the student Judicial Board for censure.

Weekly quizzes: Weekly quizzes will be electronic and found under "quizzes" on "myCourses". There will be 7 weekly quizzes, one each week in which there is NOT an exam. During exam weeks, instead of an electronic quiz, there will be a review homework. QUIZZES MAY NOT BE COLLABORATED UPON IN ANY WAY WITH ANYONE. Homework is, as always, collaborative. Quizzes will be due by Friday at 8 p.m. every week.

Examinations: There will be three hourly examinations during the 10-week quarter and 1 final exam. These examinations will be cumulative, although the emphasis will be on material that has yet to appear on an exam. Each exam will count 100 points toward your course grade. **There will be no make-ups for missed exams during the quarter unless by PRIOR permission from me**. Missed exams will count as a 0. However, the lowest grade is being dropped.

You should bring a scientific calculator and extra pencils (pens). The use of laptops and headsets will not be permitted during an exam. The use of cell phones is discouraged in class. If you have to be reached, set your phone on vibrate; if an important call comes through, quietly exit the room to answer the call.

All exams are closed-book, closed-note, but you may bring a single sheet of 8-1/2x11 paper with any algebraic formulas or other information that you want. All physical constants or tables of constants and a periodic table will be provided to you for each exam.

Plagiarism or cheating in any form will not be tolerated in the course. Any case of plagiarism or cheating will result in an automatic grade of zero for the exam, and a memo documenting the event will be sent to the student's department. A second occurrence will result in a grade of "F" for the course and possible disciplinary action from the institution.

Negotiated Syllabus for General & Analytical Chemistry III

SCH-1011-217 GENERAL & ANALYTICAL CHEMISTRY III Spring 08

INSTRUCTOR: Dr. Joe Lanzafame
Office: 08-A256 Phone: x5-7471 E-Mail: jmlsch@rit.edu
Web Site: www.chemgod.com

Office Hours: MTR 10:00-11:00 a.m., WF 10:30-12:00 p.m. or by appointment.

TEXTS: Nivaldo Tro, ***Chemistry: A Molecular Approach***

COURSE OUTLINE:

Objective: Present college chemistry as a science based on empirical evidence that is placed into the context of conceptual, visual and mathematical models. Students will learn the concepts, symbolism and fundamental tools of chemistry necessary to carry on a discussion of chemistry. Emphasis will be placed on the relationship between atomic structure, chemical bonds and the transformation of these bonds through chemical reactions.

Throughout the course you will gain some important skills as well as refine some of the skills learned in Chem 215 and Chem 216. These include:

- Dimensional analysis & unit conversion
- Basics of chemical nomenclature
- Balancing chemical equations
- Solving equilibrium problems
- Using thermodynamics to determine spontaneity of a reaction
- Learn about basic organic chemistry and nomenclature
- Learn about basic biomolecules
- Working with moles, molar mass, and molarity

Schedule: Class will meet three times per week. In addition, all students should be registered for the 1-credit laboratory course, Chemical Principles III (1011-227) which meets for one 3-hour session each week. The lab is independent of the course and graded COMPLETELY separately.

Lecture notes will be available on the web site for the course. Readings for the lectures are indicated in the schedule given below; a copy of this syllabus will be available on myCourses. It is generally helpful to skim the reading assignment before lecture and attempt the pre-class problem, without worrying about understanding everything. After lecture, the material should be reexamined to clarify your questions and the post-class problems solved.

Exam dates will be finalized later. The dates on the accompanying course schedule are tentative.

COURSE ASSESSMENT:

Exams (3 hourly + 1 final – lowest dropped):	300 points
Mastering Chemistry Homework:	65 points
Exam Review Homeworks:	30 points
Attendance:	30 points
Weekly Quizzes:	70 points
Total available points:	495 points

Your progress through the course will be assessed using exams, homework/quizzes, and in-class responses. Three exams will be given throughout the quarter, and one Final (finals week) – the lowest of the FOUR exams is dropped. Each exam will account for 100 points. You will also be assessed based on weekly homework/quizzes. The cumulative homework/quiz score will account for 100 points.

The final grade for the course will be roughly based on the scale given below.

Points	Grade
445 or better	A
395 – 444	B
345 – 394	C
295 – 344	D
294 or below	F

Homework/Attendance: Homework will be collected through the www.masteringchemistry.com website. The log-in information came with your textbook. The course ID for this particular class is "CHEM217SPRING2009". Homework assignments are assigned on a daily basis. There is a pre-class and a post-class assignment for each lecture (except exams and review days). The problems come directly from the even-numbered questions in your text. There is a corresponding odd-numbered question that is very similar and has the answer in the Appendix at the back of the book.

These problem sets will help you understand my emphasis in the course. More importantly, the homework will guide you in the practice of chemistry. Practice is crucial to perform well in a quantitative, problem-oriented discipline such as chemistry. The schedule of topics is laid out in the accompanying "course schedule" and includes reading assignments from the book that correlate to the problems. Homework can be COLLABORATED UPON, so you may work in teams.

Each pre-class assignment is due by midnight of the day before class. Each Monday and Tuesday post-class assignment is due by Friday midnight. Each Thursday post-class assignment is due by Sunday midnight before the following class.

I will also be using the "clickers" to take daily attendance worth another 30 points, but there are numerous opportunities to get bonus points on clicker questions by getting the correct answer. It should be EASY to get 20 or more of these bonus points (see below). With 65 points in online homework + 30 points in review homework (also

online), 30 points in attendance plus another 20 or so bonus clicker points, it should be easy to get 100/125 of these points added to your average and it would be a shame to throw them away for either not doing the assignments or skipping class.

BONUS CLICKER POINTS: There will also be questions asked in class for which you will get bonus points (not included in the 500 points above). I expect that there will be 20-30 such opportunities during the semester and these just get added to your grade.

IT IS POSSIBLE FOR ONE PERSON TO OPERATE MULTIPLE CLICKERS, so you could click-in for your friends while they are sleeping. This would constitute fraud and if I catch anyone with more than 1 clicker in class, I will eliminate all attendance points and clicker points for the entire semester for all parties involved. There is no leniency for this and the penalty will attach to the FIRST such incident. (Losing the attendance points will likely result in a 1 letter grade penalty at the end of the quarter.) A second incident will result in an automatic "F" for the entire course and possibly referral to the student Judicial Board for censure.

Weekly quizzes: Weekly quizzes will be electronic and found under "quizzes" on "myCourses". There will be 7 weekly quizzes, one each week in which there is NOT an exam. During exam weeks, instead of an electronic quiz, there will be a review homework. QUIZZES MAY NOT BE COLLABORATED UPON IN ANY WAY WITH ANYONE. Homework is, as always, collaborative. Quizzes will be due by Friday at 8 p.m. every week.

Examinations: There will be three hourly examinations during the 10-week quarter and 1 final exam. These examinations will be cumulative, although the emphasis will be on material that has yet to appear on an exam. Each exam will count 100 points toward your course grade. **There will be no make-ups for missed exams during the quarter unless by PRIOR permission from me**. Missed exams will count as a 0. However, the lowest grade is being dropped.

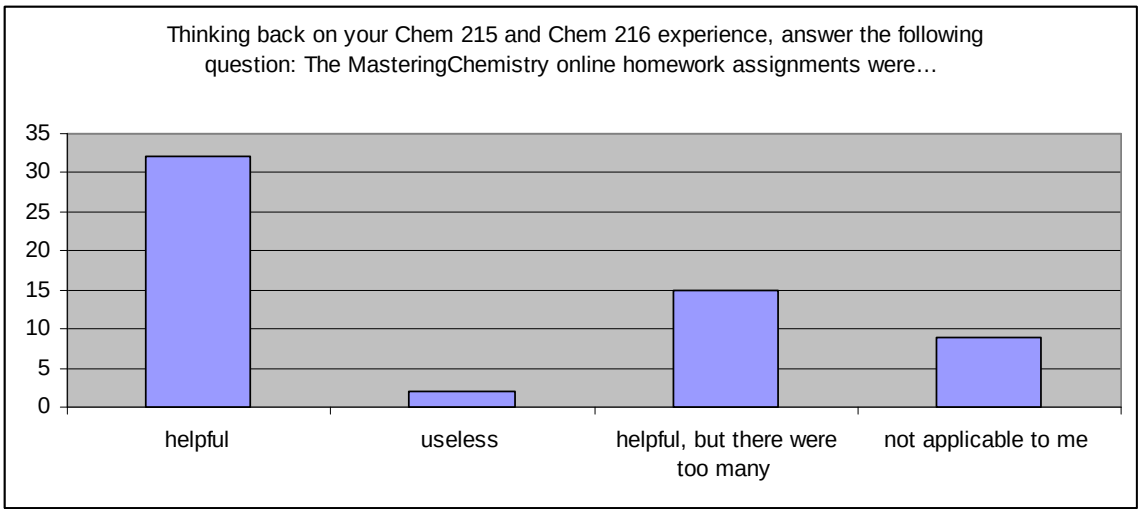
You should bring a scientific calculator and extra pencils (pens). The use of laptops and headsets will not be permitted during an exam. The use of cell phones is discouraged in class. If you have to be reached, set your phone on vibrate; if an important call comes through, quietly exit the room to answer the call.

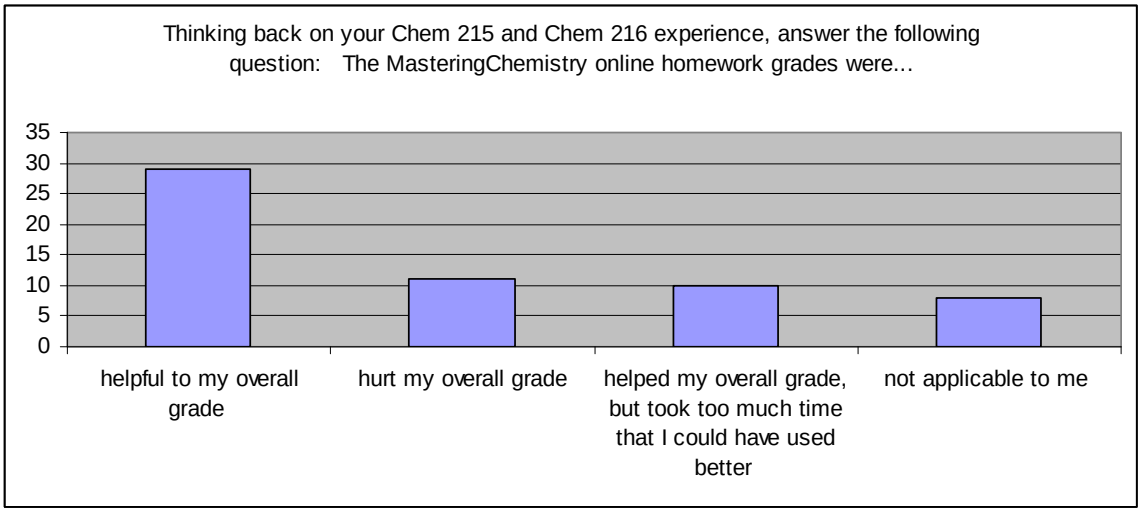
All exams are closed-book, closed-note, but you may bring a single sheet of 8-1/2x11 paper with any algebraic formulas or other information that you want. All physical constants or tables of constants and a periodic table will be provided to you for each exam.

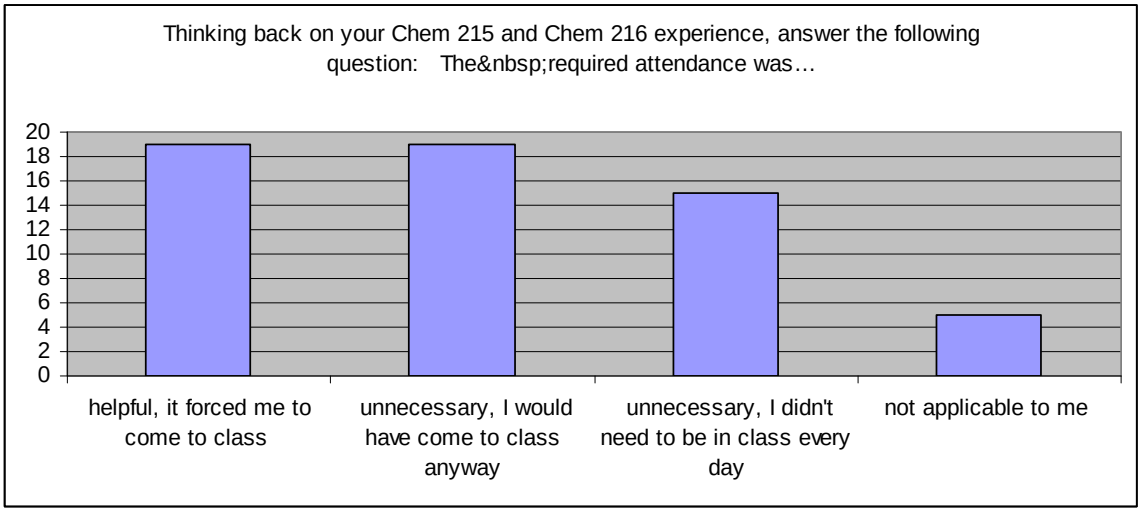
Plagiarism or cheating in any form will not be tolerated in the course. Any case of plagiarism or cheating will result in an automatic grade of zero for the exam, and a memo documenting the event will be sent to the student's department. A second occurrence will result in a grade of "F" for the course and possible disciplinary action from the institution.

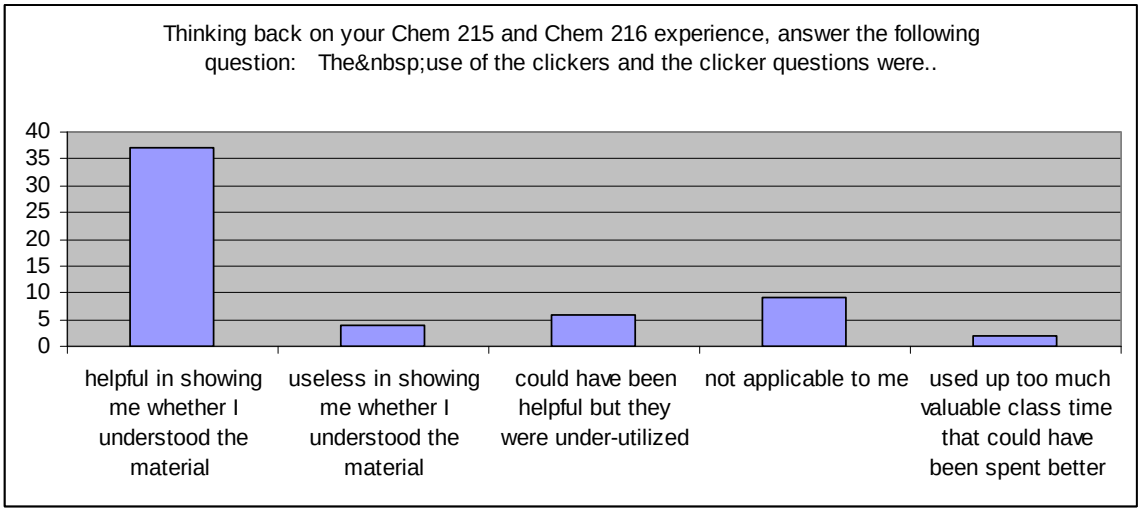
Pre-Class Survey
(Week 1, Spring 2009)

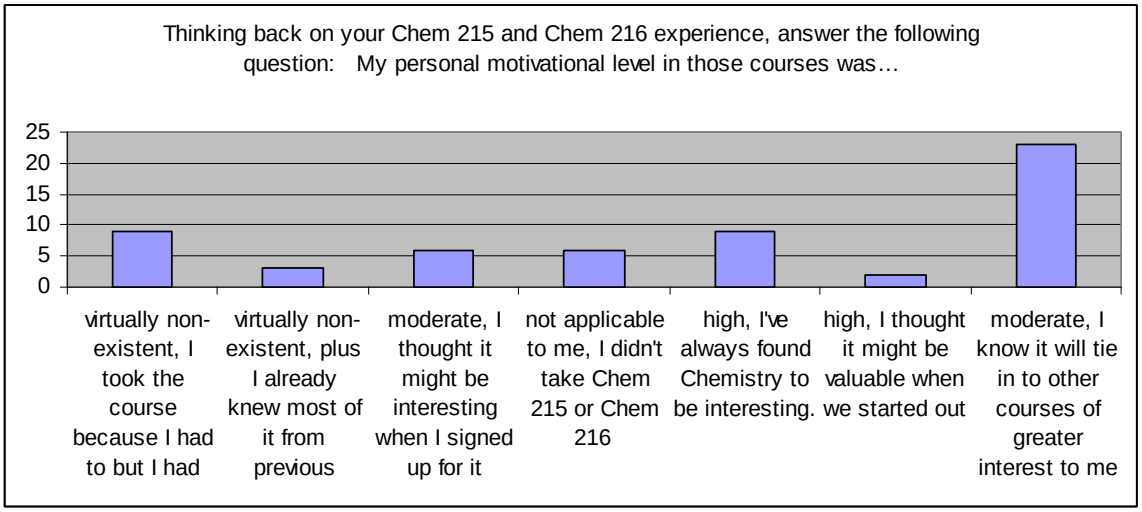
All graphs are # of students vs. response.

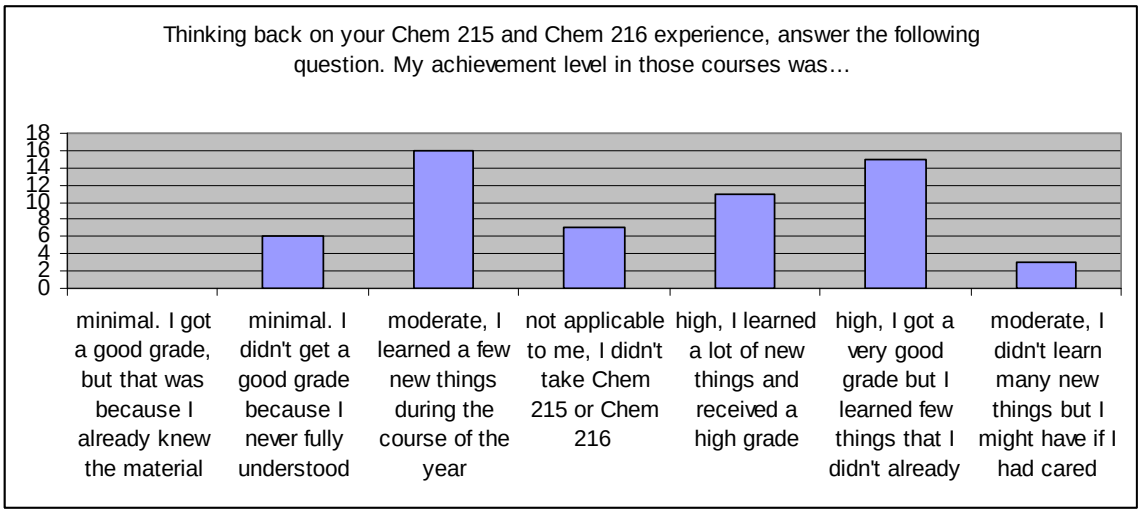

Thinking back on your Chem 215 and Chem 216 experience, answer the following question: The MasteringChemistry online homework assignments were…
35
30
25
20
15
10
5
0
helpful
useless
helpful, but there were too many
not applicable to me

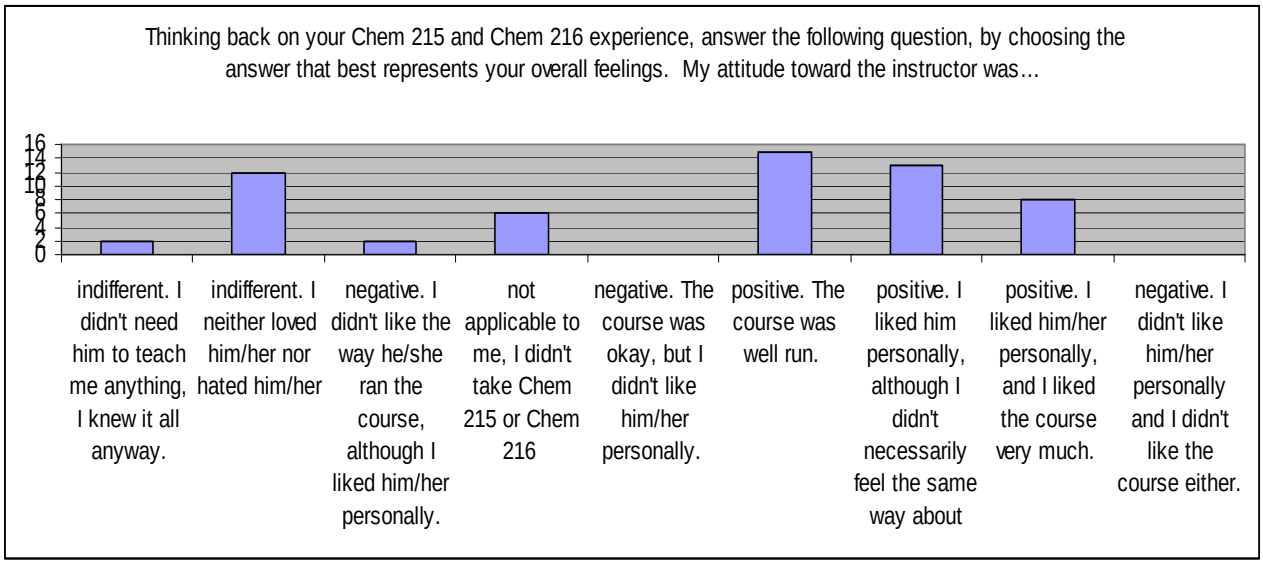

Thinking back on your Chem 215 and Chem 216 experience, answer the following question: The MasteringChemistry online homework grades were...
35
30
25
20
15
10
5
0
helpful to my overall grade
hurt my overall grade
helped my overall grade, but took too much time that I could have used better
not applicable to me

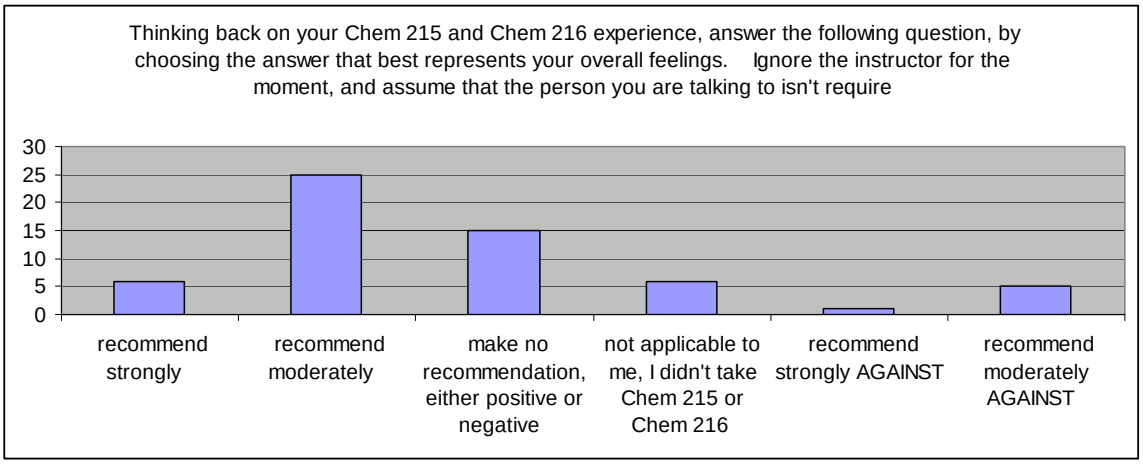

Thinking back on your Chem 215 and Chem 216 experience, answer the following question: The required attendance was…
20
18
16
14
12
10
8
6
4
2
0
helpful, it forced me to come to class
unnecessary, I would have come to class anyway
unnecessary, I didn't need to be in class every day
not applicable to me

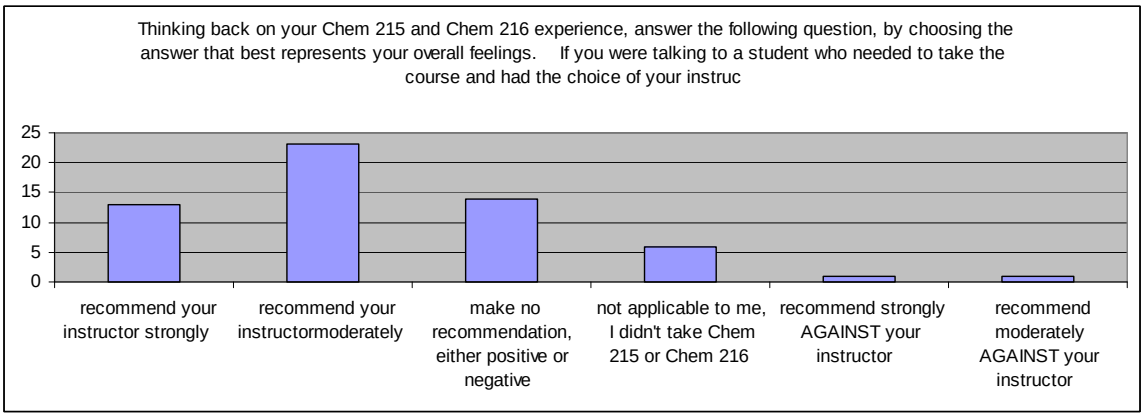

Thinking back on your Chem 215 and Chem 216 experience, answer the following question: The use of the clickers and the clicker questions were..
40
35
30
25
20
15
10
5
0
helpful in showing me whether I understood the material
useless in showing me whether I understood the material
could have been helpful but they were under-utilized
not applicable to me
used up too much valuable class time that could have been spent better

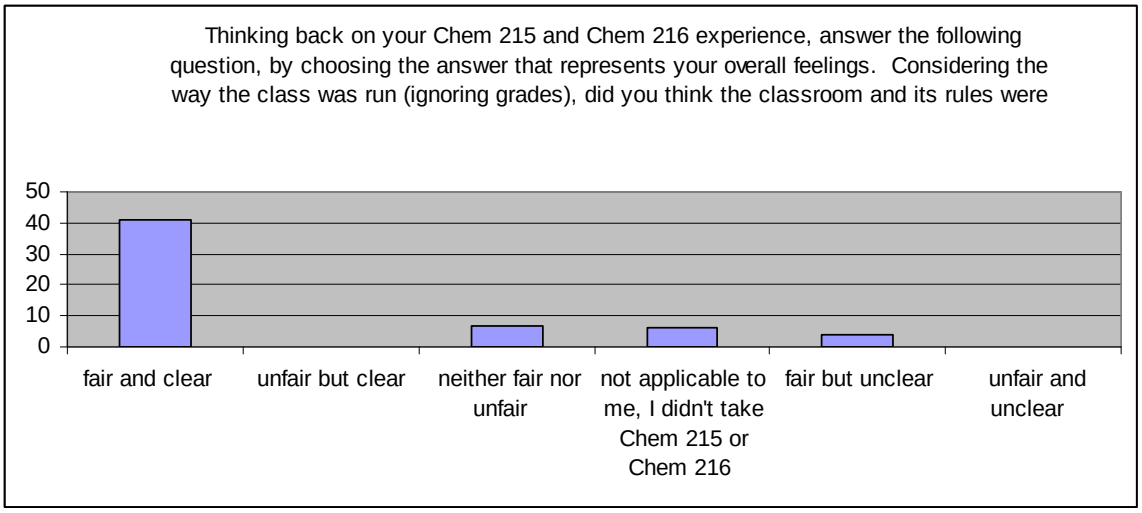

Thinking back on your Chem 215 and Chem 216 experience, answer the following question: My personal motivational level in those courses was…
25
20
15
10
5
0
virtually non-existent, I took the course because I had to but I had
virtually non-existent, plus I already knew most of it from previous
moderate, I thought it might be interesting when I signed up for it
not applicable to me, I didn't take Chem 215 or Chem 216
high, I've always found Chemistry to be interesting.
high, I thought it might be valuable when we started out
moderate, I know it will tie in to other courses of greater interest to me

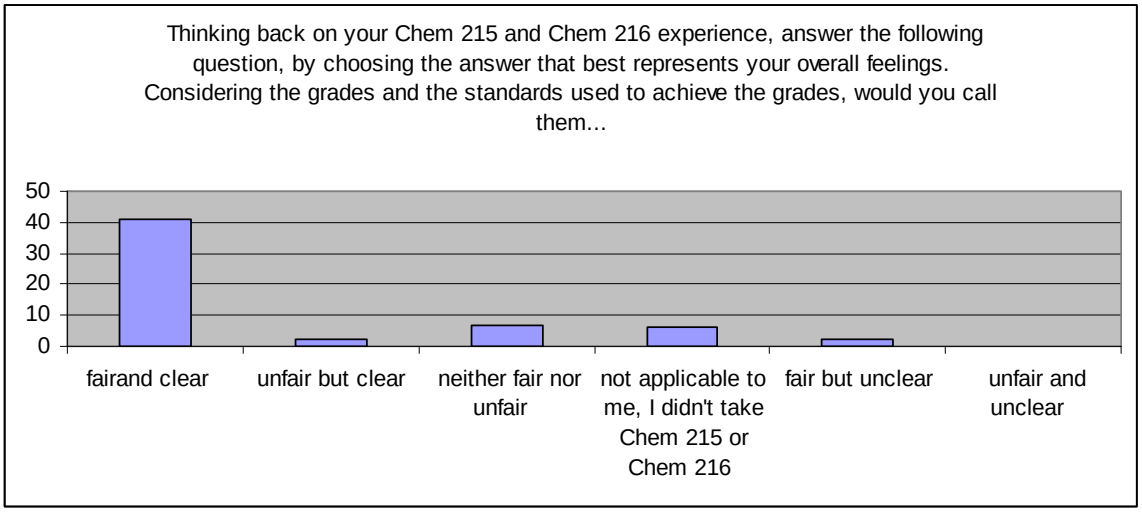

Thinking back on your Chem 215 and Chem 216 experience, answer the following question. My achievement level in those courses was…
18
16
14
12
10
8
6
4
2
0
minimal. I got a good grade, but that was because I already knew the material
minimal. I didn't get a good grade because I never fully understood
moderate, I learned a few new things during the course of the year
not applicable to me, I didn't take Chem 215 or Chem 216
high, I learned a lot of new things and received a high grade
high, I got a very good grade but I learned few things that I didn't already
moderate, I didn't learn many new things but I might have if I had cared

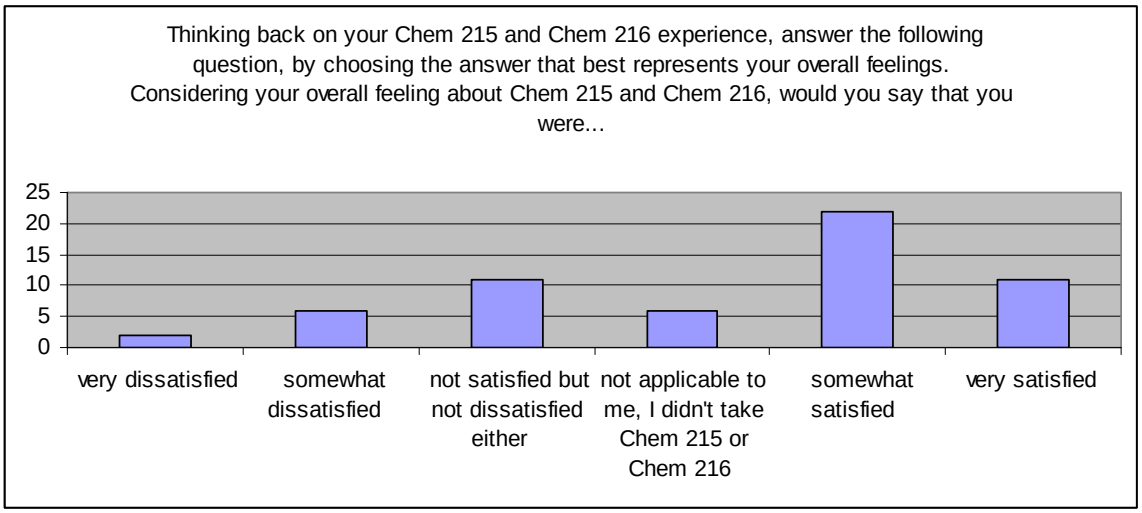

Thinking back on your Chem 215 and Chem 216 experience, answer the following question, by choosing the answer that best represents your overall feelings. My attitude toward the instructor was...
16
14
12
10
8
6
4
2
0
indifferent. I didn't need him to teach me anything, I knew it all anyway.
indifferent. I neither loved him/her nor hated him/her
negative. I didn't like the way he/she ran the course, although I liked him/her personally.
not applicable to me, I didn't take Chem 215 or Chem 216
negative. The course was okay, but I didn't like him/her personally.
positive. The course was well run.
positive. I liked him personally, although I didn't necessarily feel the same way about
positive. I liked him/her personally, and I liked the course very much.
negative. I didn't like him/her personally and I didn't like the course either.


Thinking back on your Chem 215 and Chem 216 experience, answer the following question, by choosing the answer that best represents your overall feelings. Ignore the instructor for the moment, and assume that the person you are talking to isn't require
30
25
20
15
10
5
0
recommend strongly
recommend moderately
make no recommendation, either positive or negative
not applicable to me, I didn't take Chem 215 or Chem 216
recommend strongly AGAINST
recommend moderately AGAINST


Thinking back on your Chem 215 and Chem 216 experience, answer the following question, by choosing the answer that best represents your overall feelings. If you were talking to a student who needed to take the course and had the choice of your instruc
25
20
15
10
5
0
recommend your instructor strongly
recommend your instructormoderately
make no recommendation, either positive or negative
not applicable to me, I didn't take Chem 215 or Chem 216
recommend strongly AGAINST your instructor
recommend moderately AGAINST your instructor

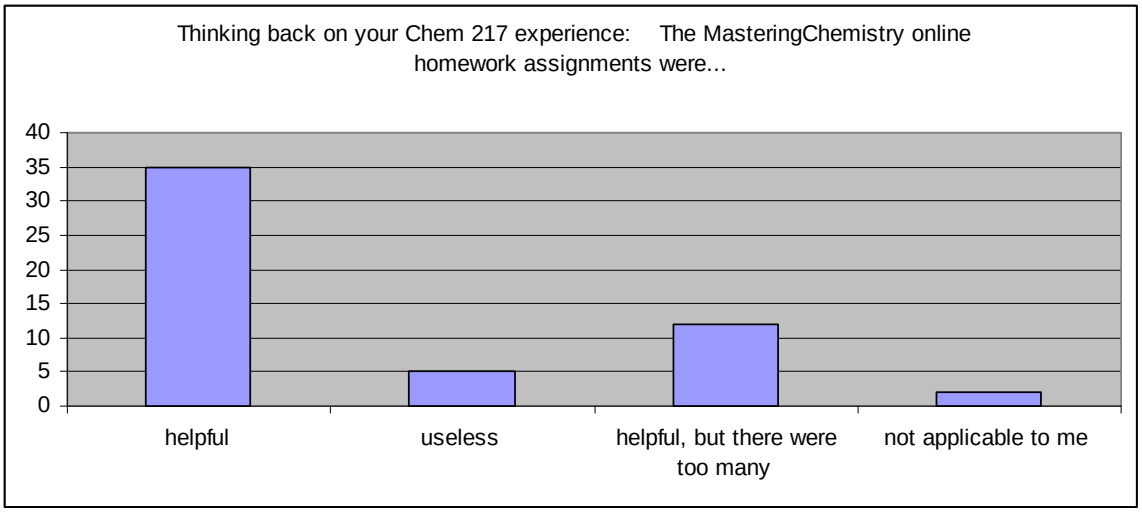

Thinking back on your Chem 215 and Chem 216 experience, answer the following question, by choosing the answer that represents your overall feelings. Considering the way the class was run (ignoring grades), did you think the classroom and its rules were
50
40
30
20
10
0
fair and clear
unfair but clear
neither fair nor unfair
not applicable to me, I didn't take Chem 215 or Chem 216
fair but unclear
unfair and unclear

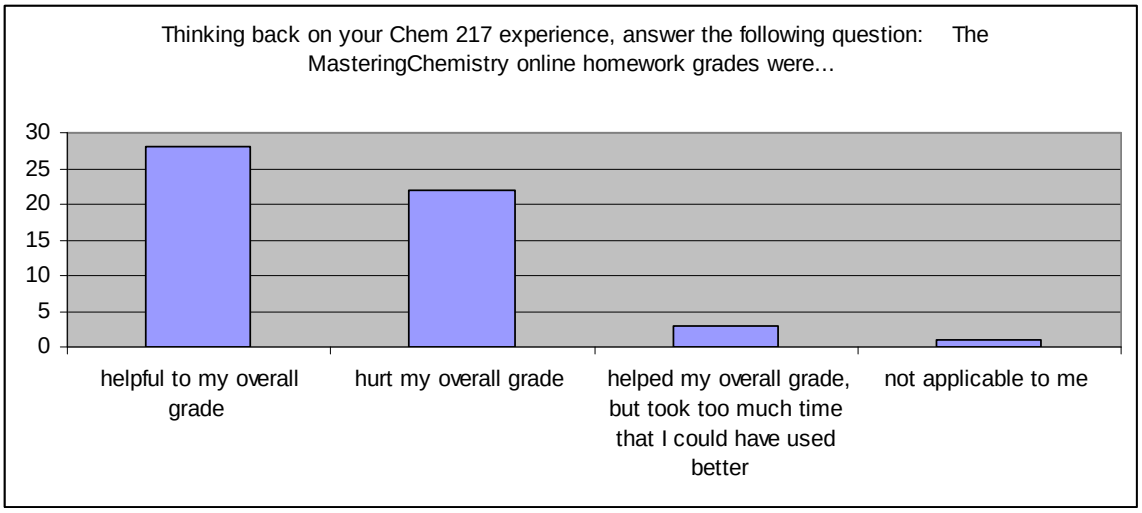

Thinking back on your Chem 215 and Chem 216 experience, answer the following question, by choosing the answer that best represents your overall feelings. Considering the grades and the standards used to achieve the grades, would you call them...
50
40
30
20
10
0
fairand clear
unfair but clear
neither fair nor unfair
not applicable to me, I didn't take Chem 215 or Chem 216
fair but unclear
unfair and unclear

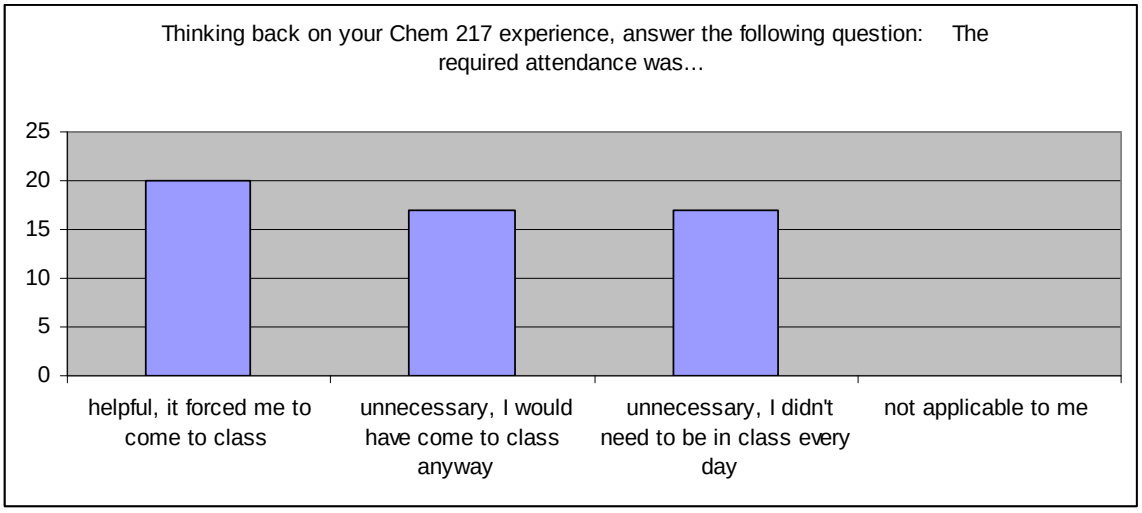

Thinking back on your Chem 215 and Chem 216 experience, answer the following question, by choosing the answer that best represents your overall feelings. Considering your overall feeling about Chem 215 and Chem 216, would you say that you were...
25
20
15
10
5
0
very dissatisfied
somewhat dissatisfied
not satisfied but not dissatisfied either
not applicable to me, I didn't take Chem 215 or Chem 216
somewhat satisfied
very satisfied

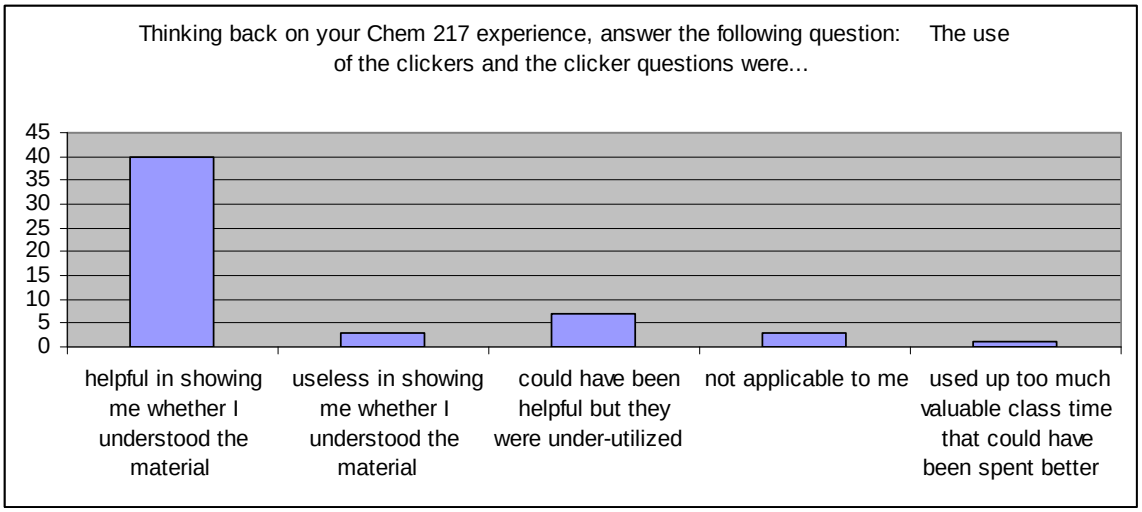
Post-class Survey
(Week 10, Spring 2009)

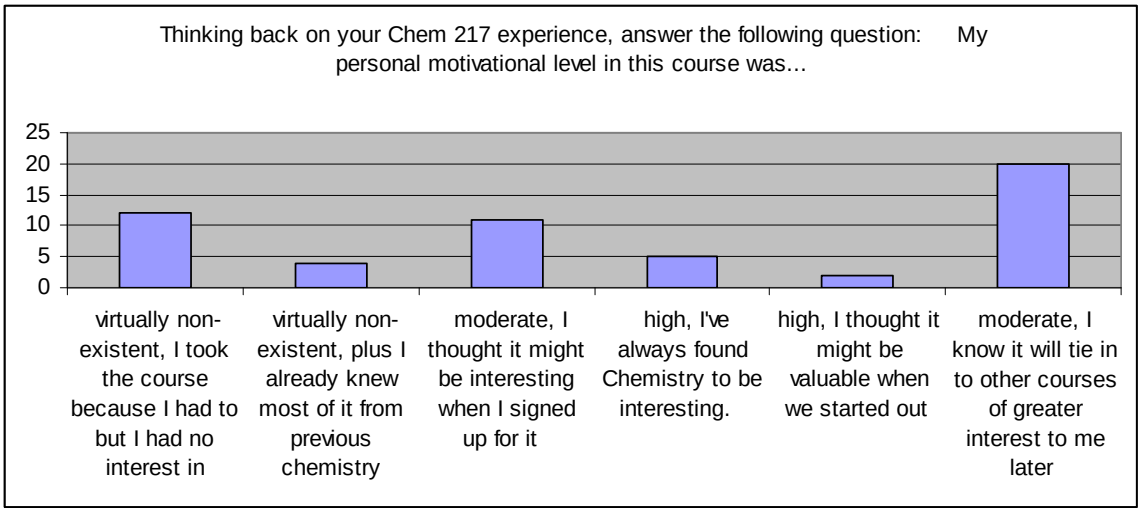
All graphs are # of students vs. response.

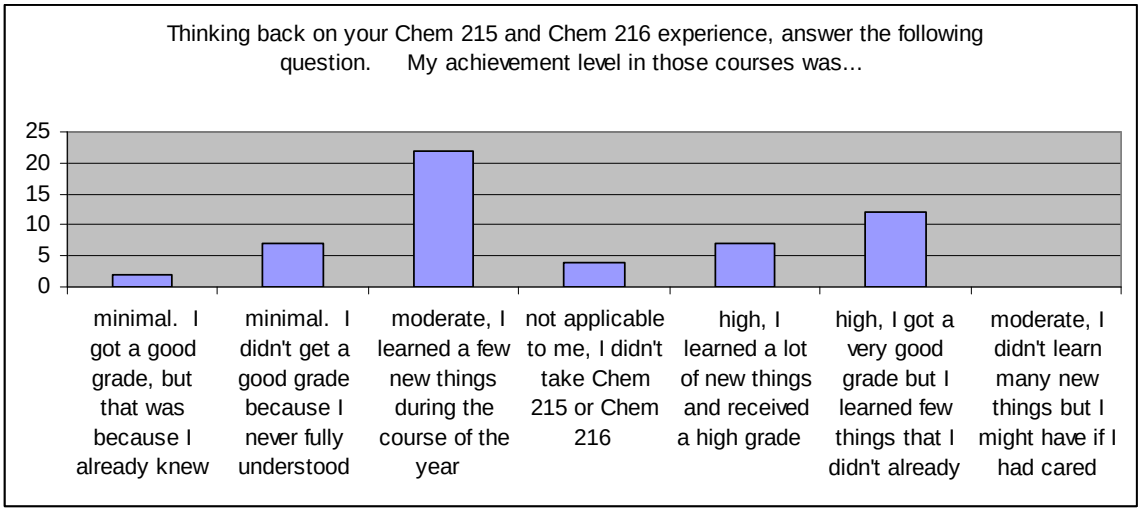

Thinking back on your Chem 217 experience: The MasteringChemistry online homework assignments were...
40
35
30
25
20
15
10
5
0
helpful
useless
helpful, but there were too many
not applicable to me

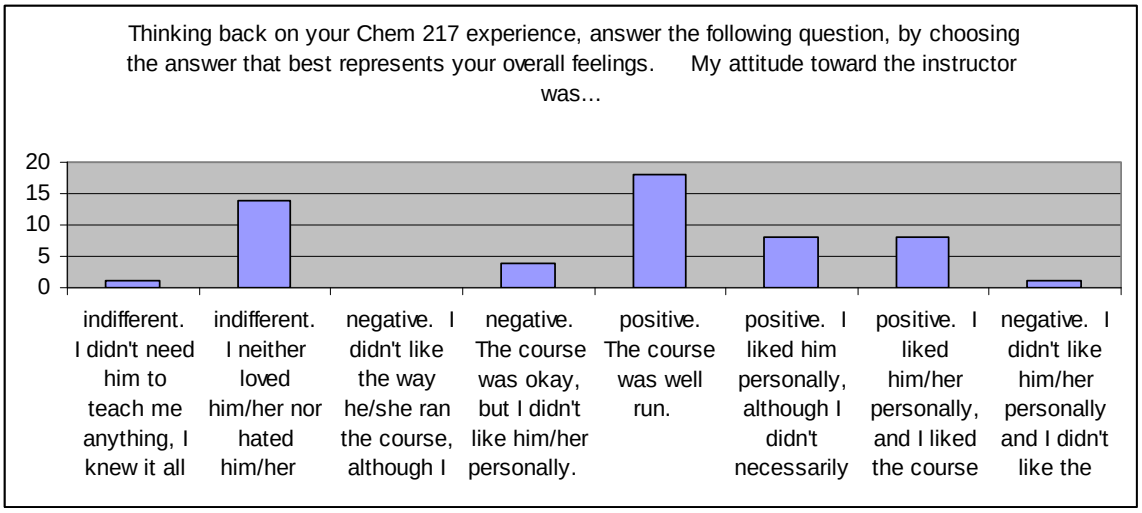

Thinking back on your Chem 217 experience, answer the following question: The MasteringChemistry online homework grades were...
30
25
20
15
10
5
0
helpful to my overall grade
hurt my overall grade
helped my overall grade, but took too much time that I could have used better
not applicable to me

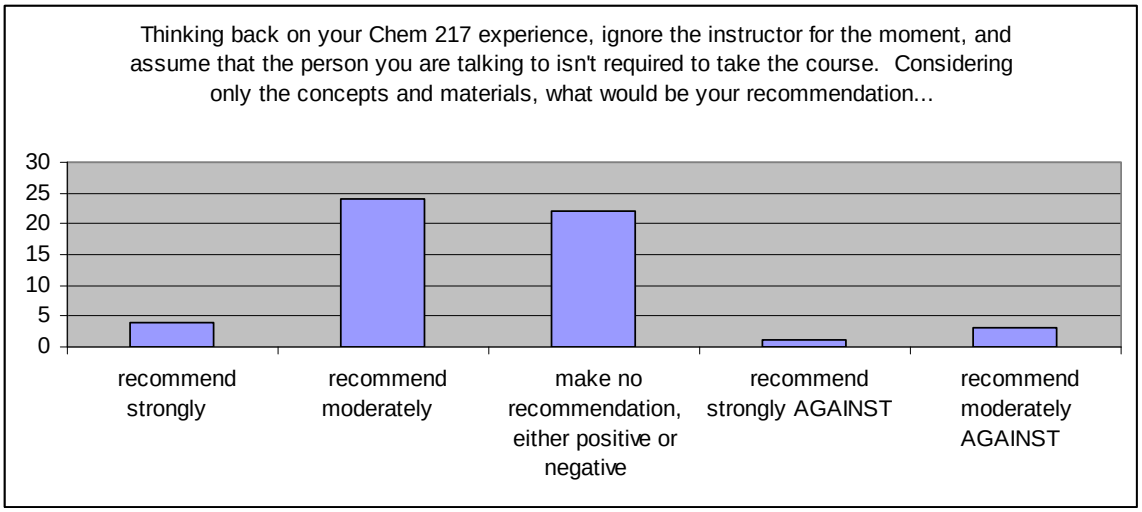

Thinking back on your Chem 217 experience, answer the following question: The required attendance was...
25
20
15
10
5
0
helpful, it forced me to come to class
unnecessary, I would have come to class anyway
unnecessary, I didn't need to be in class every day
not applicable to me

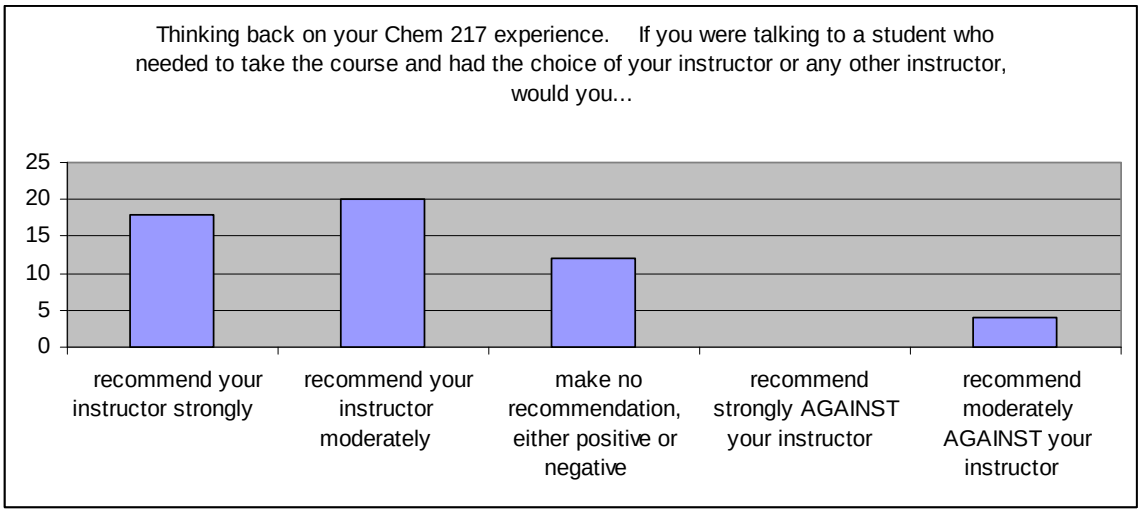

Thinking back on your Chem 217 experience, answer the following question: The use of the clickers and the clicker questions were...
45
40
35
30
25
20
15
10
5
0
helpful in showing me whether I understood the material
useless in showing me whether I understood the material
could have been helpful but they were under-utilized
not applicable to me
used up too much valuable class time that could have been spent better

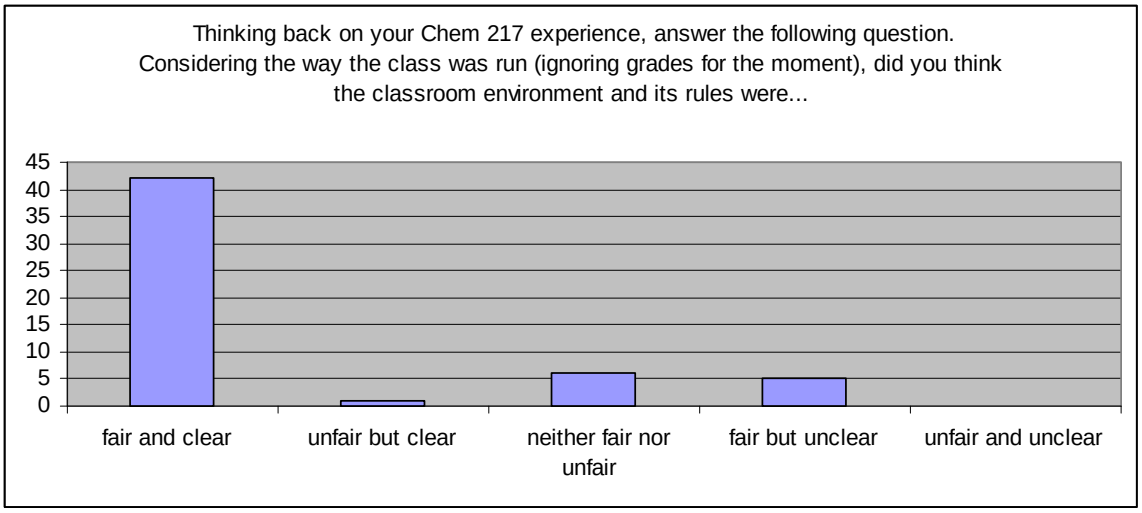

Thinking back on your Chem 217 experience, answer the following question: My personal motivational level in this course was...
25
20
15
10
5
0
virtually non-existent, I took the course because I had to but I had no interest in
virtually non-existent, plus I already knew most of it from previous chemistry
moderate, I thought it might be interesting when I signed up for it
high, I've always found Chemistry to be interesting.
high, I thought it might be valuable when we started out
moderate, I know it will tie in to other courses of greater interest to me later

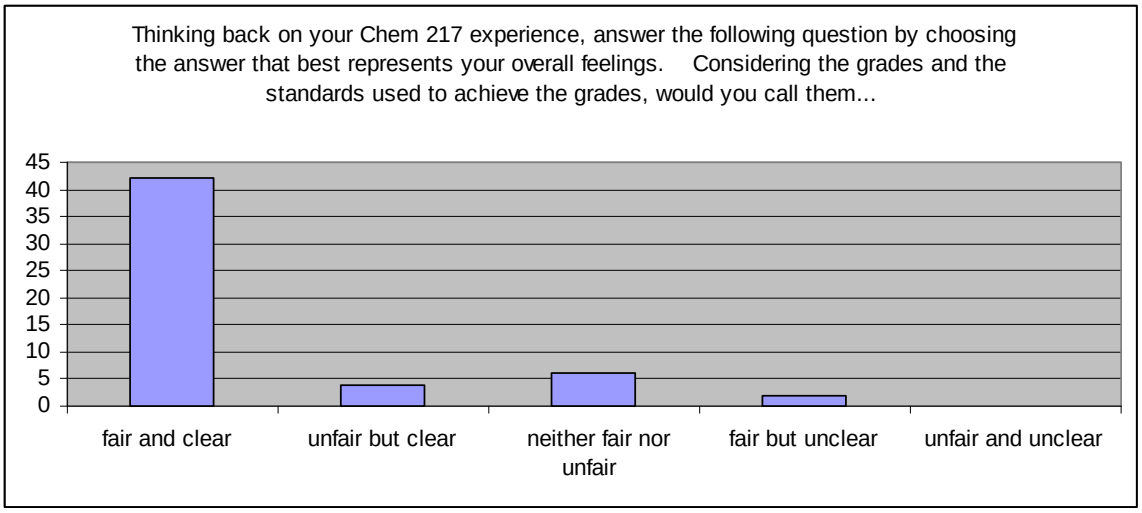

Thinking back on your Chem 215 and Chem 216 experience, answer the following question. My achievement level in those courses was...
25
20
15
10
5
0
minimal. I got a good grade, but that was because I already knew
minimal. I didn't get a good grade because I never fully understood
moderate, I learned a few new things during the course of the year
not applicable to me, I didn't take Chem 215 or Chem 216
high, I learned a lot of new things and received a high grade
high, I got a very good grade but I learned few things that I didn't already
moderate, I didn't learn many new things but I might have if I had cared

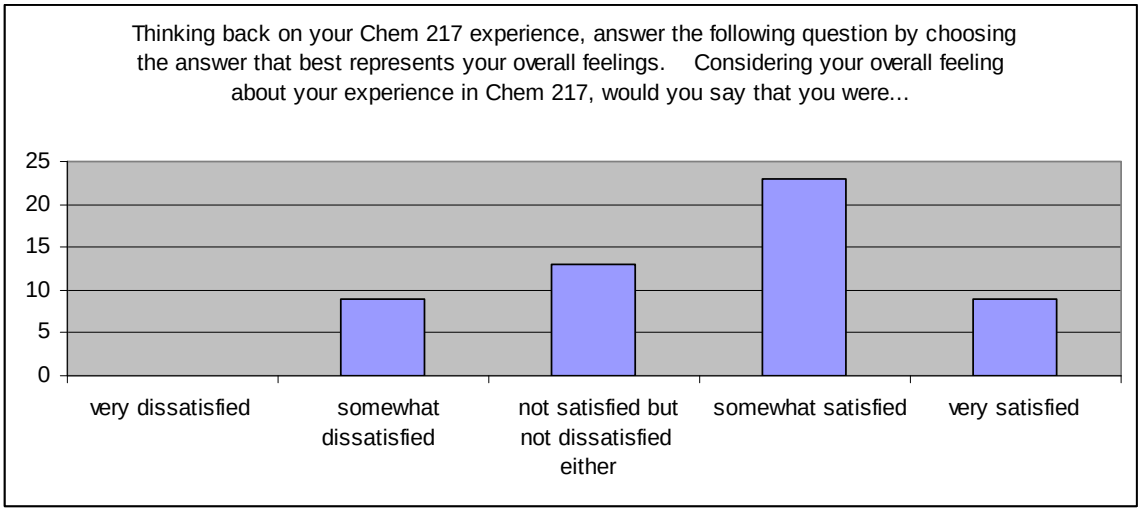

Thinking back on your Chem 217 experience, answer the following question, by choosing the answer that best represents your overall feelings. My attitude toward the instructor was...
20
15
10
5
0
indifferent. I didn't need him to teach me anything, I knew it all
indifferent. I neither loved him/her nor hated him/her
negative. I didn't like the way he/she ran the course, although I
negative. The course was okay, but I didn't like him/her personally.
positive. The course was well run.
positive. I liked him personally, although I didn't necessarily
positive. I liked him/her personally, and I liked the course
negative. I didn't like him/her personally and I didn't like the

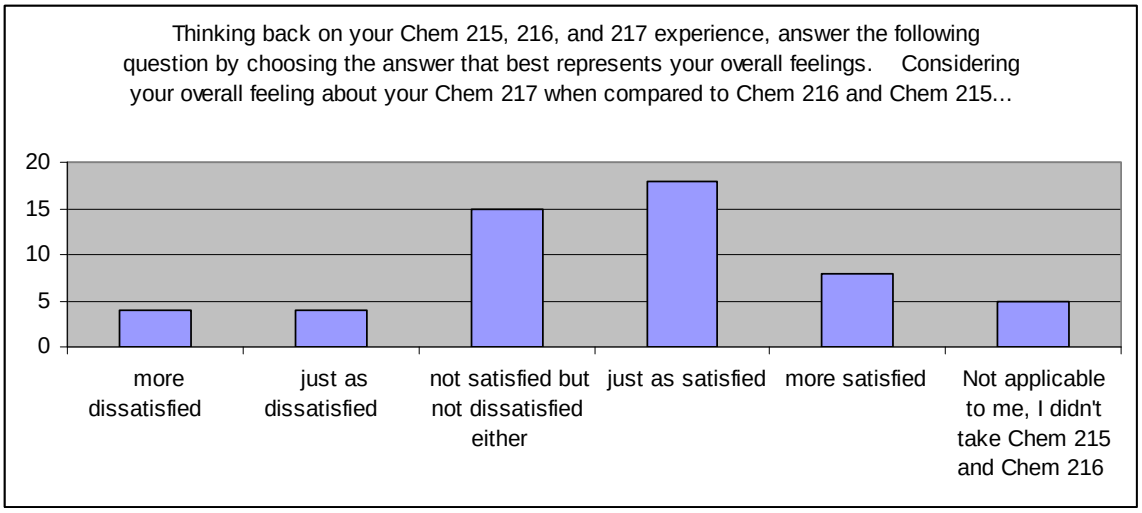

Thinking back on your Chem 217 experience, ignore the instructor for the moment, and assume that the person you are talking to isn't required to take the course. Considering only the concepts and materials, what would be your recommendation...
30
25
20
15
10
5
0
recommend strongly
recommend moderately
make no recommendation, either positive or negative
recommend strongly AGAINST
recommend moderately AGAINST


Thinking back on your Chem 217 experience. If you were talking to a student who needed to take the course and had the choice of your instructor or any other instructor, would you...
25
20
15
10
5
0
recommend your instructor strongly
recommend your instructor moderately
make no recommendation, either positive or negative
recommend strongly AGAINST your instructor
recommend moderately AGAINST your instructor


Thinking back on your Chem 217 experience, answer the following question.
Considering the way the class was run (ignoring grades for the moment), did you think the classroom environment and its rules were...
45
40
35
30
25
20
15
10
5
0
fair and clear
unfair but clear
neither fair nor unfair
fair but unclear
unfair and unclear


Thinking back on your Chem 217 experience, answer the following question by choosing the answer that best represents your overall feelings. Considering the grades and the standards used to achieve the grades, would you call them...
45
40
35
30
25
20
15
10
5
0
fair and clear
unfair but clear
neither fair nor unfair
fair but unclear
unfair and unclear


Thinking back on your Chem 217 experience, answer the following question by choosing the answer that best represents your overall feelings. Considering your overall feeling about your experience in Chem 217, would you say that you were...
25
20
15
10
5
0
very dissatisfied
somewhat dissatisfied
not satisfied but not dissatisfied either
somewhat satisfied
very satisfied


Thinking back on your Chem 215, 216, and 217 experience, answer the following question by choosing the answer that best represents your overall feelings. Considering your overall feeling about your Chem 217 when compared to Chem 216 and Chem 215...
20
15
10
5
0
more dissatisfied
just as dissatisfied
not satisfied but not dissatisfied either
just as satisfied
more satisfied
Not applicable to me, I didn't take Chem 215 and Chem 216