

LASC Report Summary:

The 2015-2016 academic year was the second year of that the Liberal Arts and Sciences Curriculum (LASC) liberal studies program was assessed at Minnesota State University Moorhead (MSUM). While some examples of good assessment practices can be highlighted, it is also clear that LASC assessment at MSUM needs to be improved.

The first improvement is communication. Towards the end Spring, 2016, Panopto video directions were added to the LASC assessment page to help faculty fill out the forms correctly. One pervasive misunderstanding found on the completed forms was the intent of the question “In what way(s) was student learning most evident?” The intent of this question was for the faculty to provide examples, anecdotes, and other qualitative information that showed solid student understanding of the student learning outcome (SLO)– information that can be used to add context to the numbers and strengthen a report. The majority of faculty, on the other hand, answered the question in terms of a particular artifact such as “the test” or “class discussions.” This clarification will be a point of emphasis in communicating with faculty this year. A second way that this question was frequently answered incorrectly was to include all questions/prompts used, without reflecting on student performance. Reflection leading to action is the most important part of assessment process.

Although the above misunderstanding was problematic, there were three other patterns that were more serious. First, a large number of faculty who taught LASC classes did not participate – with perhaps 25% of LASC classes being assessed (although this varies widely by LASC area and department). Total LASC reports for 2014-2015 and 2015-2016 are summarized in Table 1, below. While this low participation may have many reasonable causes (faculty time, etc.), it is unlikely to be viewed favorably at reaccreditation and can be interpreted as a lack of professional reflective practice.

Table 1. LASC Assessment 2014-2016

LASC Area	Total 2014 – 2015 participation	Total 2015-2016 participation
1A	1 course, 35 students	1 course, 255 students
1B	1 course, 62 students	No LASC 1b course assessment reports were received. 32 WI courses and 918 students were assessed on LASC 1b competencies.
2	10 courses, 632 students	5 courses, 406 students
3	19 courses, 1535 students	16 courses, 1095 students
4	18 courses, 999 students	18 courses, 772 students
5	30 courses, 2356 students	18 courses, 1634 students
6	19 courses, 700 students	21 courses, 758 students
7	9 courses, 562 students	9 courses, 508 students
8	24 courses, 973 students	18 courses, 579 students
9	12 courses, 441 students	12 courses, 553 students
10	12 courses, 505 students	13 courses, 631 students

Second, a number of faculty demonstrated a lack of understanding of, or commitment to, the LASC assessment process with their answers to the questions. Some faculty noted that they did not teach or assess the stated SLOs, and instead substituted their own learning outcome. In another case, faculty

stated the content delivery (e.g. “lectures”) were the ways learning was most evident. This statement seems to reflect a belief that telling is teaching and teaching is learning and shows no evidence that data on student performance was collected and analyzed. Similarly, it was frequently stated by some faculty that learning “did not fall short”. As I have never taught a class where I could not find at least one topic where students learning could have been improved, this answer may reflect a distrust of how administration will use an admission that learning fell short or low faculty standards rather than superior teaching and learning. Similarly, it is hoped that implementation of the AAC&U VALUE Rubrics for assessment can lead to improved consistency in the definitions of exemplary, competent, developing, and incomplete across classes. VALUE inspired rubrics for all LASC areas are available for faculty to download and customize for their classes in D2L zip formats. Scoring using a D2L rubric has the potential to greatly simplify assessment process while also improving consistency across classes.

The third problem observed on LASC forms was that answers were often so brief as to make interpretation of the learning in the broader university context next to impossible. While the LASC feedback rubric was not provided early enough in the 2015-2016 school year to help these reports, it is hoped that the LASC rubric, along with the feedback provided, will result in improved reports in 2016-2017.

One final trend that has emerged from the data is that several LASC areas have one SLO that is not assessed by many classes. If, for example, almost no science classes actually assess SLO4 from LASC area 3, does MSUM have a complete picture of LASC 3 competency on campus?

In conclusions, faculty are reminded that:

- (a) the LASC assessment forms are available in Microsoft Word from at www.mnstate.edu/assess/gea/lasc-forms.aspx,
- (b) revisit your SLOs as you write your syllabus and design key assignments. Two consistent positives noted on the LASC forms were improving prompts and assignments to specifically align with SLOs and to provide more scaffolding assignments to support student learning of the SLOs.
- (c) D2L rubrics are available at www.mnstate.edu/assess/gea/lasc-forms.aspx as well as a Panopto video on how to use them. Using a D2L rubric to complete LASC assessment allows a seamless transfer of compiled statistics from your assignment to the LASC form.

Thank you for your support of the MSUM assessment process, and please direct any assessment questions to assess@mnstate.edu.

LASC AREA: 1A oral communication

YEAR: 2015-2016

Total Number of Reports: 1 (representing multiple sections of COMM 100)

Classes: COMM 100

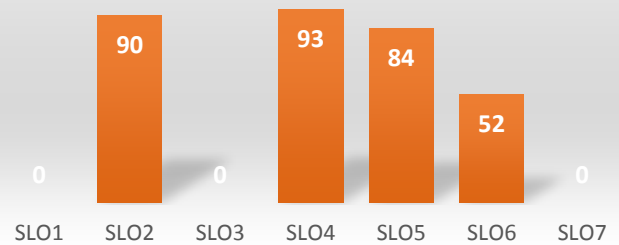
Delivery: Hybrid/blended = 0, Face-to-face = 1, Online = 0

Total Number of Students: 255

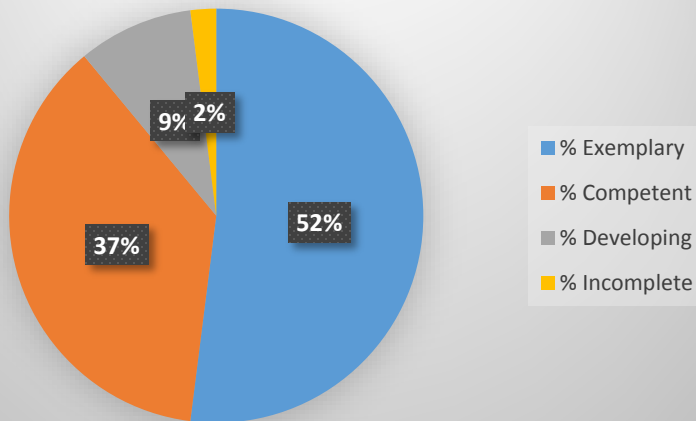
Basis of Assessment:

- Multiple Choice: 0
- Short Answer: 0
- Essay: 0
- Paper 1-5 pages: 0
- Paper 6-10 pages: 0
- Paper 11-15 pages: 0
- Individual Projects: 0
- Group Projects: 1
- Individual presentations: 1
- Group presentations: 0
- Individual labs/activities: 0
- Group labs/activities: 0
- Other: 11, peer evaluations

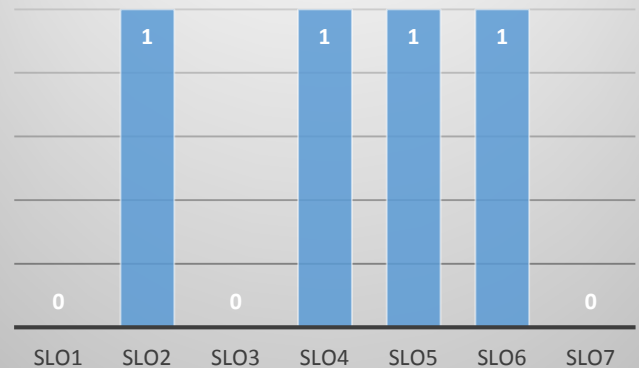
Percent of Students Achieving Exemplary or Competent on Each SLO



% of students at each level overall



Number of Classes Assessing Each Outcome



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7	% E	% C	%D	%I
N of classes assessing	0	1	0	1	1	1	0				
Mean % pass/average		90		93	84	52		52	37	9	2

Changes/innovations to the class: Peer evaluations and an online survey of group performance were added this year.

Ways in which learning was most evident: The instructors teaching COMM 100 pointed out specific examples that demonstrated evidence of how students were meeting or exceeding competence for each learning outcome.

Ways learning fell short: Likewise the instructors teaching COMM 100 pointed out specific examples that demonstrated evidence of how students were falling short of competence for each learning outcome.

Proposed changes: Many specific changes to the supports (Q&A sessions in groups, practicing speeches in groups, brainstorming multiple drafts of attention grabbers in groups, etc.) were discussed.

LASC AREA: 1B and Writing Intensive, Written Communication

YEAR: 2015-2016

Total Number of Reports: 32 (although no data came from ENG 101, all came from writing intensive classes).

Classes: ACCT 460, ANTH 327, ART 345, ART 450, AT 420, CHEM 304, ENGL 202, ENGL 288, ENGL 388, ENGL 488, ENGL 491, PSY 330, FINC 325, FINC 460, GEOS 315, HIST 205, HIST 440, HSAD 420, MATH 416, MATH 491, NURS 303(x2), NURS 473 (x2), PE 310, PHIL 311, PMGT 385, PSY 430, SC 407, SOC 352, SPAN 302.

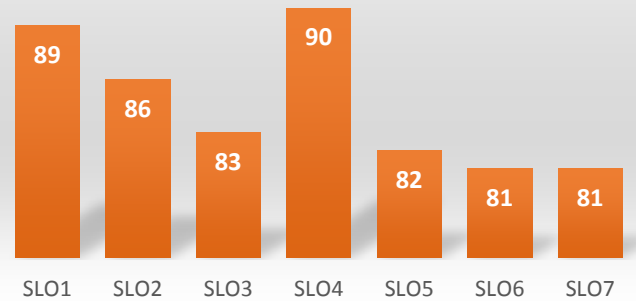
Delivery: Hybrid/blended = 2, Face to Face = 21, Online = 9

Total Number of Students: 918+ (1 class indicated that there were 3 sections, but not total enrollment).

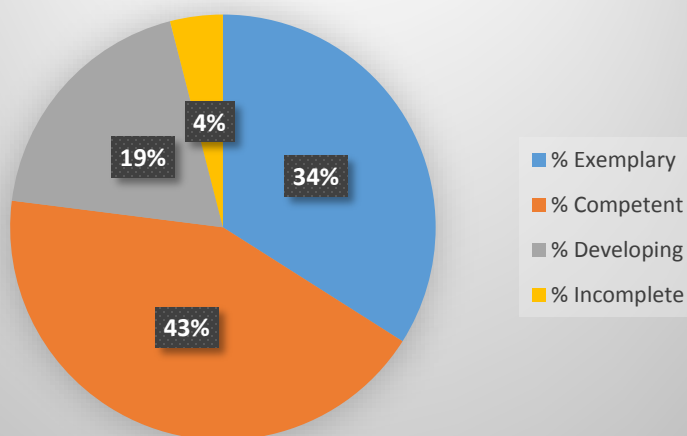
Basis of Assessment:

- Multiple Choice: 8
- Short Answer: 5
- Essay: 5
- Paper 1-5 pages: 21
- Paper 6-10 pages: 19
- Paper 11-15 pages: 14
- Individual Projects: 11
- Group Projects: 8
- Individual presentations: 9
- Group presentations: 4
- Individual labs/activities: 2
- Group labs/activities: 2
- Other: 11, self-assessments, discussions, blogs, oral exams, online discussions/assignments, clinical health project, labs, informal writing.

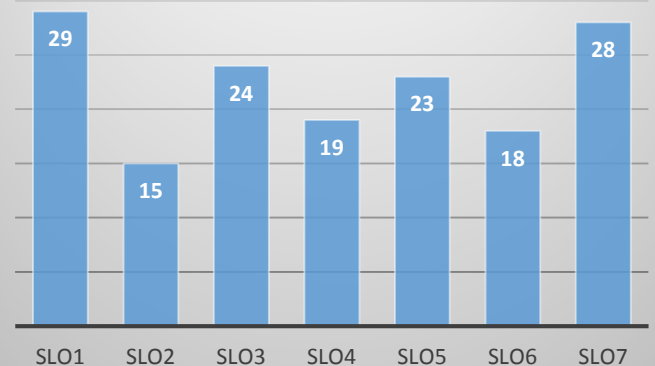
Percent of Students Achieving Exemplary or Competent on Each SLO



% of students at each level overall



Number of Classes Assessing Each Outcome



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7	% E	% C	%D	%I
N of classes assessing	29	15	24	19	23	18	28				
Mean % pass/average	89	86	83	90	82	81	81	34	43	19	4
St.Dev.	16	19	20	10	18	21	22	22	15	14	5

Changes/innovations to the class: As this was the first year that writing intensive classes were assessed using this format, most instructors responded that they had made no curricular changes or left this prompt blank. About 20% of instructors mentioned relatively minor changes to assignments, readings, or rubrics with entirely new assignments mentioned in three cases.

Ways in which learning was most evident: More than any other area, the instructors of these WI classes had a tendency to list the assessment where a particular SLO was most evident as opposed to specific anecdotes of how learning was most evident.

Ways learning fell short: What follows is a list of concerns that appeared in multiple (2+) responses to WI Assessment prompts. The concerns appear in, roughly speaking, descending order of concern, with the most repeated issue (revision) at the top and the least repeated issue at the bottom.

- Students do not properly revise; they only revise for surface errors; they seem unable or unwilling to embrace “deep revision”; they will revise shorter papers but not longer ones.
- Students do not adequately participate in peer editing; they seem unable or unwilling to embrace this opportunity; they seem shy and under-confident; some show up for peer editing unprepared (no rough draft or inadequate rough draft).
- Students do not use proper source materials; students have difficulty discerning biased from unbiased sources.
- Students struggle to achieve a formal, academic style.
- Students struggle to achieve focus; discussions stray beyond the parameters of the paper.
- Students fail to cite properly.
- Students tend towards summary over analysis.
- Students show poor understanding of mechanics.

Proposed changes: A few of the proposed changes concerned ideas outside of class instruction. It was suggested that the credits for Spanish were increased from 3 to 4 to allow coverage of both the language content as well as the LASC and WI outcomes. Other instructors suggested screening weak non-native English speakers from participating in class.

From a curricular standpoint, most suggestions focused providing additional time/examples/instruction/supports for student learning.

Other notes: There was a large discrepancy between the number of classes assessing a particular SLO, from a high of 29 classes (almost 90%) assessing SLO1 to a low of 15 classes (fewer than half) assessing SLO2.

There were substantial challenges with this group of instructors in recording useable quantitative data. There were several issues here, including inconsistent data. Mistakes were made in both directions - if all individual SLOs show 90-100% of students meet or exceed competence, then the overall percent of students failing to meet standards could not be 10%. Conversely, if all individual SLOs showed between 10-50% meeting or exceeding competence, then the overall percent of students meeting the standards could not be 70%.

A few instructors seemed to not perform analysis at the level of individual SLOs as all SLOs showed the exact same percent of students meeting/exceeding competence.

One final issue was that many instructors (10 of 32) showed 100% of students meeting or exceeding competence across multiple SLOs. While it is possible that their students were able to achieve such remarkable outcomes, alternative explanations such as grade inflation or distrust of how this data might be used for instructor evaluation are also possible. It is important that appropriate feedback is given to these faculty/departments and that perhaps professional development on the use of the rubrics is implemented.

LASC AREA: 2, Critical Thinking

YEAR: 2015-2016

Total Number of Reports: 5

Classes: ART 270, ECON 100 (2 scts.), HIST 101, UNIV 121

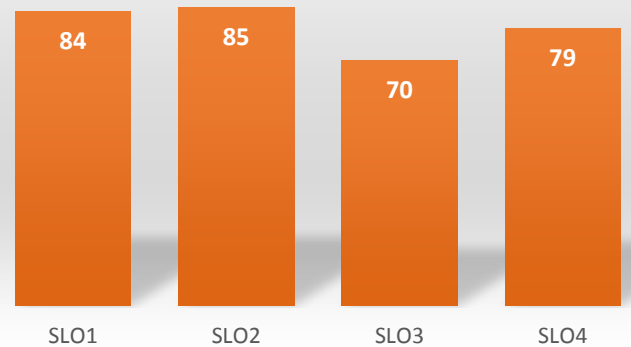
Delivery: Hybrid = 0, Face to Face = 5, Online = 0

Total Number of Students: 406

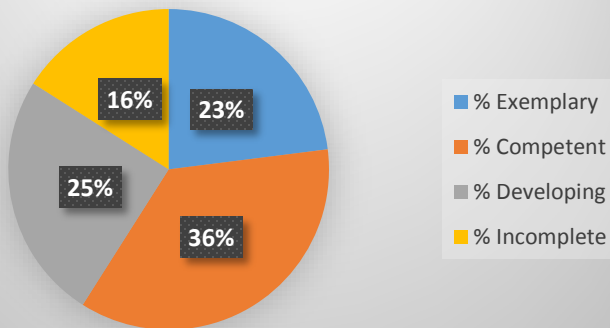
Basis of Assessment:

- Multiple Choice: 4
- Short Answer: 1
- Essay: 2
- Paper 1-5 pages: 2
- Paper 6-10 pages: 0
- Paper 11-15 pages: 0
- Individual Projects: 0
- Group Projects: 0
- Individual presentations: 1
- Group presentations: 2
- Individual labs/activities: 2
- Group labs/activities: 0
- Other: 1, D2L essays; 1, online homework.

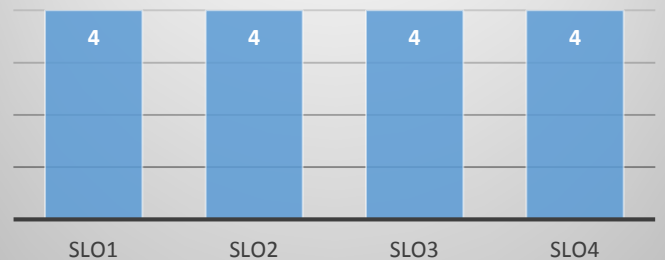
Percent of Students Achieving Exemplary or Competent on Each SLO



% of students at each level overall



Number of Classes Assessing Each Outcome



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	% Exemplary	% Competent	% Developing	% Incomplete
N of classes assessing	4	4	4	4				
Mean % pass/average	84	85	70	79	23	36	25	16
St.Dev.	11	12	18	13	14	10	8	12

Changes/innovations to the class

- Instructor added additional in-class and group activities.
- Instructor added more graded activities.
- Assessment focused more on specific critical thinking skills.
- Instructor requires a group presentation in all sections.

Ways in which learning was most evident

- Students read a research article published by the Federal Reserve Bank of Minneapolis on income mobility in the United States. Nearly all students were able to state the factors that the researchers identified as significantly related to income mobility in brief essays they composed. Further, most students discussed the presence or absence of these factors in their own family or community within their essays. A question on the comprehensive final exam verified students' retention of this knowledge. These responses reveal that 85% of students' knowledge on this topic was exemplary or competent.
- Students gathered facts from readings. They applied them by making oral arguments in a game and writing papers.
- Relevant sources were selected and cited, presentations were clear and comprehensive, potential biases of authors detected, there was good identification of opinion vs fact sources.
- Students watched a video related to the financial crisis which preceded the Great Recession and were asked to consider whether decisions were made in response to moral hazard or systemic risk. Eighty-three percent of students could articulate the difference between moral hazard and systemic risk and relate each concept to the decision maker perspectives featured in the video within a brief essay written at an exemplary or competent level. Some students even recognized that the ongoing actions of investment banks, insurers, and government entities were dependent upon the tolerance of particular decision makers to moral hazard or systemic risk.
- Students addressed at least 2 sides of an issue most of the time.
- Students read an article related to how increased drug use impacts labor markets for Minnesota firms and were asked to relate this information to the production possibilities frontier economic model. Most students stated the assumptions of the production possibilities model correctly in the context of Minnesota's labor market. Knowledge of the production possibilities model was assessed using an online homework assignment. In this context, 47% of students' skills were deemed competent or exemplary and 31% of students' knowledge was categorized as developing.
- Students developed an opinion based on research.

- Most economic textbooks treat the concepts of supply and demand in a generic framework focused on legal market activity. Once students are comfortable with the mechanics of demand and supply, it is valuable for them to realize that the market forces discussed are as common to markets with illegal activity (trading ivory tusks) as those with legal activity. Nearly all students who watched the video, “Battle for Elephants,” were able to recognize how supply and demand affect the equilibrium price and equilibrium quantity traded even when the commodity being traded, ivory, is not a legalized commodity to trade. A question on the comprehensive final exam verified students’ retention of this knowledge. In this context, 54% of students’ skills were deemed exemplary, 40% of students’ skills were deemed competent, and 5% of students’ knowledge was categorized as developing.
- Students responded to the oral arguments made by other students in the class.
- Students could: articulate their personal response to evidence; identify values assumptions in recommendations; identify personal responsibility for choices .

Ways learning fell short

- Some responses on D2L and essays were short and did not fully consider biases as prompted.
- Students demonstrated trouble organizing data and describing what the data show. Sometimes they struggled differentiating between describing what the data show and providing explanations for what the data show.
- Students had difficulty identifying the presence of bias in the research. Very few students (~10%) listed additional factors contributing to income mobility within their essays in addition to those included in the research study. Comprehensive final exam responses reveal that 15% of students’ knowledge on factors contributing to income mobility was developing.
- Some didn’t read or write to the extent requested.
- Students demonstrated occasional lack of depth in sources, and selected opinion pieces rather than factual.
- Some student responses did not focus enough on discovering "problems" and "solutions" in issues relevant to the course.
- Students tended to confuse assumptions with claims (mentioned twice by instructors).
- Some students had trouble remaining engaged with complex content for a length of time (such as the full lecture period).
- A few students chose to not participate in the activity that was assessed.
- Some students started with personal bias and looked to support that rather than looking beyond (mentioned twice by instructors).
- Some students focused their questions too much on their confusion and not enough on an analysis of argument/logic.
- Only a few students discussed both short-term and long-term consequences of drug use by laborers to Minnesota’s production possibilities within their essay. More detailed instructions may encourage students who could identify short-term consequences to likewise consider long-term consequences. Online homework assignments revealed that 22% of students’ knowledge was classified as inadequate with respect to the production possibilities model.
- Students were better good at presenting facts, less successful at evaluating implications.
- Students sometimes did not link assumptions to conclusions appropriately.
- Ivory trade is an issue shaped by economic, cultural, legal, and religious forces. Some students, interested in using only an economic lens for analysis in an economics class, fail to see the true complexity of global markets characterized by interactions between the economy and society. However, with only 1% of students’ knowledge falling in the inadequate category, it appears that students are clear on the economic forces at work in this market.
- Some students could not separate their own from others’ assumptions.

Proposed changes

The proposed changes tended to be either: (1) very specific ones on how to change the activity that was assessed in order to improve the outcomes or (2) general ideas about what types of activity should be increased to develop better critical thinking.

- More in-class discussion and follow up to these D2L responses to further contextualize readings, and to reinforce ideas of "perspective" and interpretation.
- A small group discussion could be included as an intermediate step in the learning process. / 1. Each student reads the article / 2. Each student writes an essay relating the article to his/her own experience / 3. Each student joins a group of 3-5 other students to discuss the article's strengths and weaknesses, focusing on whether or not any biases were present / 4. Each student answers the question on the final exam that pertains to the topic of income mobility in the U.S. /
- More instruction on what to look for in a good source
- Following this assignment, it would be beneficial to engage students in small group discussions in class to improve their ability to understand alternative reactions of citizens and taxpayers to the actions taken by government officials and Federal Reserve Bank representatives. It may be good to have them answer a second essay question following small group discussion such as: Did your original viewpoint change after participating in the discussion? Why or why not?
- More focus on errors in logic and analyzing argument
- The activity was presented early in the semester and should be introduced with greater clarity given that students may not have completed an activity of this nature before. Namely, students are expected to make connections between a theoretical economic model and the productive capacity of actual Minnesota firms. The instructions to this assignment should prompt students to draw and explain how the production possibilities frontier appears presently compared to scenarios with increased or decreased drug use by Minnesota laborers.
- Perhaps more in class exercises .
- More in class discussion or group discussion of questions from D2L.
- The activity might be improved by asking students to assume some predetermined identity (rural African person, urban African person, African government official, ivory poacher, Chinese citizen demanding ivory, Chinese government official, or global citizens) before analyzing the debate surrounding this issue. This might better allow the student to understand a viewpoint or perspective different from his/her own.

Other notes

Instructors's comments tended to be either very terse and hard to understand, or very lengthy and specific. I found the lengthy comments to be much more useful to understand what is really going on with our students' critical thinking. I also would think that the terse comments may not be so helpful for the faculty in revising/improving their course, unless these notes are coming from a more lengthy set of notes they are keeping to themselves.

LASC AREA: 3, Natural Science

YEAR: 2015-2016

Total Number of Reports: 18

Classes: ANTH 120 (1 sct), AST 104 (1 sct), BIOL 104 (2 scts), BIOL 109 (1 sct), CHEM 150/150L (2 scts), GEOS 115 (1 sct), GEOS 116 (1 sct), GEOS 170 (2 sct), GEOS 330 (1 sct), HON 318 (1 sct), PHYS 160 (1 sct), PHYS 170 (3 scts), PHYS 161 (1 sct), PHYS 200 (1 sct), PHYS 201 (1 sct)

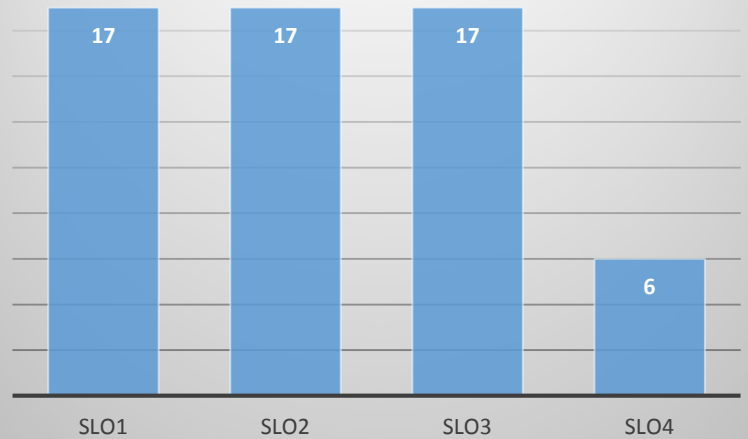
Delivery: Hybrid = 0, Face to Face = 20, Online = 0

Total Number of Students: 1120

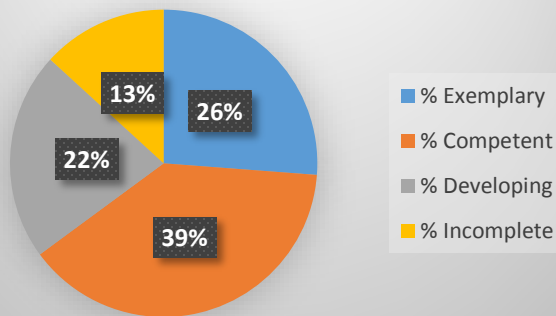
Basis of Assessment:

- Multiple Choice: 14
- Short Answer: 10
- Essay: 5
- Paper 1-5 pages: 7
- Paper 6-10 pages: 1
- Paper 11-15 pages: 0
- Individual Projects: 1
- Group Projects: 0
- Individual presentations: 1
- Group presentations: 3
- Individual labs/activities: 6
- Group labs/activities: 13
- Other: 1, cumulative semester grade; 1 homework problems; 1 lab notebook

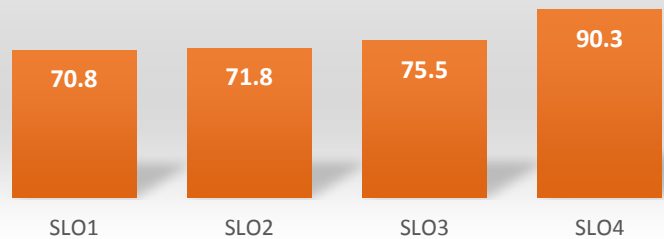
Number of Classes Assessing Each Outcome



% of students at each level overall



Percent of Students Achieving Exemplary or Competent on Each SLO



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	% Exemplary	% Competent	% Developing	% Incomplete
N of classes assessing	17	17	17	6				
Mean % pass/average	70.8	71.8	75.5	90.3	26.2	38.7	21.9	13.2
St.Dev.	14.8	23.6	16.1	8.9	14	10.7	9.8	10.3

Changes/innovations to the class

- More discussion and repetition of specific evolutionary concepts. Assigned reading and in-class activity on indices prior to the lab. Modeled for the class how to use data to draw conclusions. Reworded questions on the lab.
- We have increased the use of interactive lecture tutorials instead of traditional lecture and deliberately incorporated interpretation of graphed data into those tutorials based on the assessment of AST 104 in Spring 2015. (Though AST 104 covers somewhat different content than AST 102, the structure of the course, its student population, and their typical weaknesses are all similar to AST102).
- Class "lab-like" activity was removed.
- This semester, students were required to present orally on two experiments (Al + HCl and NaOH + HCl). The first presentation was more informal and focused on their ability to discuss their results and compare them to the results of other groups. The 2nd, more formal presentation focused more on data collection and error, and student's ability to note 1. sources of error, 2. aspects of the procedure that minimized error and 3. suggestions for further improvements that could reduce error.
- I believe I may have stressed theories/models more than usual, because that was the area of my dissertation and I have a particular interest in that area, although I have no baseline data on the extent to which this was discussed previously.
- This course may have become WI since the last report, with greater emphasis on writing and peer-review and less emphasis on the experimental design elements of labs.
- The lecture style is peer-instruction format that includes multiple discussions during the course of a 50-minute lecture. The labs, writing assignments, homework, and lecture have been redeveloped to be more connected. Hopefully this reinforces the main ideas of the course better.
- Because we had 16 Tuesdays during this semester, I split the first lab into 2 parts in an attempt to emphasize the oral component of SLO3 that had not been formally assessed previously. Groups were allowed to use different approaches in lab the first day, and they obtained markedly different results, which led them to different fundamental conclusions (A. the ball is slowing down, and B. the ball is moving at a constant speed). Then in the following lecture, they were to present their conclusions, which differed, and I would then guide this to a discussion of data, which differed, and finally to a discussion of methods, which differed, which closely mirrors one of the 5th grade standards that these elementary education majors are supposed to teach. Unfortunately, even the groups I had personally walked through their data analysis and I knew for a fact had a curve (indicating slowing down) stated that the ball was rolling at a constant speed, which negated an effective disagreement and

subsequent discussion. I will have to reexamine if the provided supports were "too good" and even led students with the poor (curving) data to conclude that their data was flawed (which it was) before they made it to lecture. Unfortunately, no future semesters have 16 Tuesdays (in fact, there may not even be any day of the week with 15 class meetings starting Fall 2016, so fitting in the 15 labs aligned with the BOT/Minnesota Academic Standards in Science will be hard enough without taking the time to redo this.

- Unfortunately, the opportunities to implement the 2 day assessment (possible because of 16 Tuesdays in Fall 2015) of oral explanation of data/results was not possible in spring (only 15 lab days) or summer (only 14 lab days). Based on future calendars, a revision to class might be necessary to make sure the oral component continues to be assessed.
- A move was made to use Top Hat clicker software and have students answer in-class questions using their personal phones. Clicker questions come with the curriculum, newly adopted 3 years ago, but low-tech use was implemented prior to this semester. The idea was that by monitoring and analyzing student answers, students would be more "active" in their learning.

Ways in which learning was most evident

The "best" comments from faculty discussed general competencies, followed by an example of how the faculty saw students accomplishing this competency. Less helpful, but still revealing quite a bit about what students could do, were statements about specific tasks that students learned how to do. Comments are divided into these two categories below.

Statements that relate to SLOs:

- Many students were able to clearly articulate the idea that a scientific idea is an idea that is testable. They could recognize that an idea that sounds scientific, because it correctly uses jargon from the discipline, is only scientific if it can be tested.
- Each Lab involved a write up in the standard scientific format which was graded and handed back with comments for the following week. The improvement of the student's lab papers over the semester was clearly evident of learning success.
- Most students demonstrated a working understanding of the most important geological theories. This was evident by a marked improvement on scores related to these questions from the midterm to the final. For example, students demonstrated their ability to apply understanding of the principles of stratigraphy and cross-cutting relationships to the interpretation of a variety of geological observations
- Students had the opportunity to answer questions on the relationship between scientific theories, laws, hypotheses and data on both their quizzes and final. We do not work much with specific theories in this class. That being said, about 50% of students improved their understanding (or at least were able to regurgitate) the correct relationships between these science concepts. Students made progress in being able to regurgitate the difference between theories and laws, and that theories do not become laws with further testing, but I am not sure they understand.
- Students could recognize, describe, and explain correct/incorrect models. For the most part their explanations were in-depth.
- In their ability to formulate and test hypotheses. Students were all successful in doing this as part of group activities. This served as a good model for students to apply when they completed the individual part of the assignment.
- Given a graph of data and a hypothesis concerning the properties of the system whose data was presented most students were able to appropriately use specific data from the question to support or refute the hypothesis. All of the students marked as "developing" used at least one piece of data from the problem appropriately.
- For the Fall 2015 semester I removed the lab simulation used to learn how to collect and interpret data and went completely with take-home dry lab activities where the students had to address aspects of the class

content, look for information from scientific sources and understand the information. This was a more successful approach, seen by observing the number of correct answers from the students in exam two and three.

- The improvement of the student's lab papers over the semester was clearly evidence of learning success. Furthermore, each 4-5 member student group had to give an oral presentation on a biology-based project of their choice. The presentations showed evidence of student success in this area.
- Students were usually capable of performing the appropriate analysis, with support.
- Most students were capable of collecting data and then coming up with suitable explanations for the patterns in the data.
- This course addresses historical science rather than physical science, so the expectations for laboratory expertise are somewhat different. For example, students had opportunities to make and interpret field observations and make notes. They also had opportunity to interpret and identify a variety of field observations brought into the classroom in the form of pictorial data. Less than 1% of students have ever done this in high school coursework--and so students start out with no understanding whatsoever and make significant and measureable progress.
- Most students were able to collect the data and display it in an appropriate way.
- Students often start out with the misconception that the goal of a science experiment is to get the "right" answer, and if the answer is "wrong" it must be due to "human error". Nearly all students gained an improved ability to think about science experiments not as extensions of the textbook--confirming preconceived theories--but rather as the foundation for the textbook--in which we gather observations that need to be interpreted and understood.
- Collection of data: students improved overall in their ability to figure out how to perform an experiment. They understood that one tries to keep every variable the same except for the control variable. They took ownership of the experiment, and were not afraid to try and work things out.
- Formulating and testing hypotheses: student learning was most evident in how students justified when theory and experiment were in agreement. Students described discrepancies in terms of how many standard deviations from the accepted value their measured value was. Their understanding of this approach improved over the course of the semester.
- Students did improve somewhat throughout the semester in their ability to reflect on appropriate choices of instruments, procedures, and semi-quantitative data analysis to determine if they had enough data to make a conclusion.
- Students improved substantially in their ability to formulate and test hypotheses, although most still want to form a hypothesis after the experiment and without scaffolding. Most will not include a "because" portion to their hypothesis, which makes it more of a guess than a hypothesis. Use of tables, graphs, and understanding of error improved throughout the course, but was never excellent.
- Formulating and testing hypotheses by performing laboratory experiments: The last lab report of the semester was assessed. Students were asked to predict the behavior of a gas under two conditions: volume of a fixed amount of gas is changed isothermally; the temperature of a fixed volume is changed. Students had a qualitative idea how the variables were related (when V decreases, P should increase, etc).
- Compared to Lab 2, by Lab 6 students were competent in plotting their data and interpreting the slope of a linear graph. They could also make a basic comparison between two values of the same quantity (spring constant), evaluated using two different experiments, and state whether the two values agreed or not.
- Students learned how to calibrate an image and make measurements from it. They also were successful for the most part in trying to control the charge on pieces of tape created in the experiment.
- In communicating their findings, students were most successful in the group part of the lab.(mentioned 3 times)
- Many students were able to clearly convey, in their own words, an understanding of the methods used in the citizen science project in which they participated.
- Some students used their data to directly support appropriate conclusions from the lab. Many were able to adequately discuss sources of error towards the end of class.

- Most students were able to produce lab reports for the culminating lab exercise in this course that requires students to explain an exercise that includes multiple geological concepts.
- The complexity of student discussion and reporting of concepts in historical science in labs, group discussion, and essay exams increased significantly through the term.
- Most students were able to identify major features and justify their interpretations.
- Students began the course with an expectation that written or oral reports should follow a pre-dictated format assigned by the instructor. Through preparation of reports (and peer review) they found ways to convey experimental results that required a variety of different formats and approaches.
- Communicate experimental findings: Most students improved in their ability to discuss and report experimental findings.
- Communicate experimental findings: The next to last lab report of the semester was graded. Most groups did a fairly good job overall of breaking the report into sections, and logically discussing each piece. Uncertainties were reported well, as they are required in the rubric.
- Students generally are writing solid lab notebook entries by the end of class. The quality of their writing in their lab notebook improved throughout the semester. Data is more organized (tables instead of paragraphs).
- Almost everyone learned how difficult it is to control variables. All reports submitted showed how control was attempted, but not really achieved in the experiment. Also, most reports were understandable and organized.
- Most reports showed that students could communicate what they had learned in the experiment (in particular, what they had learned about resistors in circuits, and how to change the resistance by changing length/area of a wire).
- Students gained an appreciation for the need to persuade through the use of observational and argumentation evidence rather than only make assertions.
- Evaluated societal issues using a meaningful comparison: In the final lab, students were asked to summarize differences between coal, oil, and nuclear power plants. Several students selected a few meaningful comparisons, and summarized their own thoughts on the matter.

Specific types of activities that students could demonstrate ability in:

- Students could apply evolutionary theory to anthropology and the history of evolutionary thought.
- Students were assessed in their ability to run experiments. In class we went over the Lederberg's experiments on bacterial genetics. We also discussed many of the scientific theories applicable to human biology. We also discussed how to set up an experiment. There were questions in the first exam about their understanding of the scientific process, and student answers were clearly evident of learning success.
- Most students were able to understand that different theories/models of bonding are optimized to explain certain behaviors. Most also seemed to grasp that many of finer points of Dalton's Atomic Theory were wrong, but the overall theory is still a useful tool for thinking about matter.
- On exam 4, students showed good overall success at being able to explain the existence and continued use of so many different models/theories of bonding (Lewis Dot Structure, VSEPR, MO Theory, Valence Bond Theory) - such as simplicity vs. accuracy or certain phenomena (like magnetism) that is predicted correctly by one theory but not another.
- More than 95% of students overcame the common misconception that seasons are caused by variable distance from the Sun, and gained an ability to explain the more nuanced cause of seasons related to the combination of earth's axial tilt relative to the plane of the ecliptic and earth's orbit around the sun.
- Students could linking the chemical and physical structure of the Earth with the theory that Earth had to be molten some time early in its history.
- Student understanding of scientific theories: A large fraction of students understand that Newton's Laws form a set of core principles that allow analysis of a number of different physical situations. In the report analyzed, many began with Newton's 2nd Law for torque and correctly made a prediction.

- Students were able to articulate Newton's 2nd and 3rd laws, and for the most part correctly related them to the diagrams that they drew on a cometary orbit. A large proportion of class time was spent having students relate such diagrams to explanations using an interactive "clicker" system (Top Hat), so it may not be surprising that they were good at this.
- Students showed ability to relate volcanic activity with proximity to tectonic plate boundaries.
- Students were able to relate human population growth to demand for limited Earth resources.
- Ability to relate positive feedback between Earth's atmosphere and oceans in that when there is an increase in excess (non-natural) greenhouse gases this impacts oceanic pH and makes the ocean more acidic. Ultimately, the students could link ocean acidification as being detrimental to marine organisms that have shells and that this, in turn, impacts the marine food chain which then impacts human food supplies.

Ways learning fell short

Again, the most useful comments from faculty related to the SLO, and also gave some specifics. A second category of comment discussed a particular math algorithm or area that students struggled with. A third category of comment pointed to a particular weakness in the learners.

Statements that relate to SLOs:

- The most egregious error was that some students stated that any logical proposition based on observations was a scientific idea. A less serious error made by many students was that an idea is scientific only if it can be proven correct; in fact the standard is that it must be possible to falsify the idea.
- I am not sure if this would count as falling short, but the vast majority of these non-major students were initially very confused about data analysis and many claimed that they just did not know how to graph data. By the end of the semester, almost all of the students had a vastly improved understanding of how to study scientific concepts. HOWEVER, this did take a long period of time during the semester for this improvement to be evident.
- While not as great an emphasis of the curriculum in this class as compared to my PSCI 170 class, some students cling to similar misconceptions like theories are half-baked ideas with inadequate support, otherwise, they would be laws. There was still a tendency to indicate (such as on the final exam) that theories can become laws with additional data. This point was drilled pretty hard on prior quizzes and exams, so it is disappointing that they still struggled.
- Students struggled to interpret geological sequences that involved more than 8 or so distinct events.
- Many students still did not comprehend that scientific methodology is an ideal, and that there are nuances for the major divisions of science.
- Approximately half of the students still clung to a naive belief about the nature of a scientific theory, either confusing it with a hypothesis, claiming it was "just what scientists think" or making it a halfway step on the way to becoming a proven law if more evidence can be found. This is a persistent misconception.
- Students do not have a strong grasp on the role of theories in science. Most (90%) come to class believing that theories become laws with further testing, and that anything that is still a theory (particularly evolution or Big Bang) is still a theory because it lacks adequate support to become a law. Regardless, it is difficult to understand a particular theory if one does not understand the overall concept. While kinetic molecular theory is discussed in class, and relativity (as it applies to gravity) is mentioned in passing, the topics of this class do not lend themselves to theories as much as laws.
- I didn't spend much time going into the "how we know it works this way" background. I tend to focus on the vector relationships that have been developed, and how to visualize them, as opposed to developing the laws

from "logic". Even still, students do struggle with translating equations into visualizations. They also tend to have difficulty recognizing when their arguments are circular or inconsistent.

- When using quantitative relationships, students had a tendency to use them incorrectly, both applying the wrong relationship as well as using the correct relationship incorrectly.
- A relatively small number of students clearly could not read the graph or were unable to express why a graph is a useful way to organize data. More were able to partially articulate how the data supported or contradicted the hypothesis but were either vague or had slight inaccuracies.
- I am not sure if this would count as falling short, but the vast majority of these non-major students were initially very confused about data analysis, however, by the end of the semester, almost all of the students had a vastly improved understanding of how to study scientific concepts. To get to this level of understanding did take a long period of time during the semester for this improvement to be evident.
- A few students were unable to explain the obvious patterns illustrated in the data.
- Because they have never done this before, the idea of making meaningful interpretations of qualitative observational data is new to them and sometimes difficult.
- Although students did well in recognizing that doing science is more than trying to get the "answer key" answer in specific lab activities and reports, they were less good at generalizing this idea to new activities where the concept was not emphasized (for example, the year-end 10 page papers in which they had to identify evidence rather than make statements of "right" or "wrong" ideas). However, writing of most students reflected an increased awareness of the observational foundation for science, even when their ability to distinguish "evidence" from "assertion" was limited.
- Appreciation of error and uncertainty: In the last lab nearly half the students failed to measure uncertainties. This has been part of the rubric all semester long. Clearly the methodology described in the first lab on uncertainty and its importance is not sticking in their minds.
- Student learning fell short whenever unexpected agreement/disagreement with theory occurred. The idea that a model is a simplification of reality is a challenging idea for students at this stage. Students tended to ignore the unexpected behavior and not comment on it. Alternatively, students would explain away the result as "human error." Very often the chance to learn more from a surprising result was missed.
- Many students still fail to consider how choices of procedure and instruments affect error and results. The exam question which had 2 sets of student data, one with excessive rounding that reached a wrong conclusion and one that used more precise numbers and reached the right conclusion, did not generate these responses.
- Appreciation of experimental error and how this limits the ability to form conclusions still eludes many, as does the idea of a controlled experiment.
- Student learning fell short in discussing the quantitative relationships among variables. For example, some students did not distinguish between a linear relation with a negative slope, and an inverse proportion.
- At this level we did not present error analysis in a formal way. So the comparisons students make between experimental numbers come from experiments in which the software can calculate an error (giving the students a plus/minus). We probably need to discuss whether this is sufficient, as many students are freshmen in this class, and will most likely encounter formal error analysis in their later science classes. Just understanding what the +/- in the software means seems tricky for many of the students.
- Students had a difficult time developing and understanding the procedure (even when given lots of guidance). This points out that students are way better at following someone else's direction, than thinking through a simple set of steps on their own. They also tried to apply this procedure in a later experiment in class that had a small change in the set-up, indicating lack of understanding.
- On the individual part of this lab, students had trouble making use of ranges in addition to averages.
- While analysis was often performed, students largely want to let the data speak for itself and often fail to use it to directly support a conclusion statement, if one is even written.
- Some students continued to use the high-school format of listing a set of "ingredients" for the lab and then providing inadequate explanation of experimental details and limited analysis of the results and their implications.

- Relating uncertainty to whether two measurements are significantly different, and drawing a logical conclusion: In the last lab, some students could not appropriately judge whether two values were significantly different, and relate this to their hypothesis.
- It is not uncommon for students to leave out important details, such as the units of a physical quantity, or confuse units.
- Many students do not record data in tables or otherwise write their results in a scientifically appropriate format.
- Still a long way to go. Conclusions are presented without data. Data is collected without being summarized into a conclusion. While informal assessment of understanding (i.e. conversations with faculty) reflect the same issues as the formal written assessment, only written communication is formally assessed.
- Many have difficulty with the mathematical language used to describe physical laws. Many demonstrate a lack of familiarity with essential basic terms in the physical principles. For example, some students do not draw a distinction between velocity and acceleration, and this lack of clarity affects their ability to reason clearly.
-
- This was the second rather extensive lab report the students submitted (lab 2, although not so extensive, also required some writing). Some of these reports were not well organized, or were missing sections.
- Most reports were difficult to follow, and many appeared to reach invalid conclusions about electric field, current, and resistance.

Specific types of activities that students struggled in:

- Questions addressing specific concepts (the nuts and bolts) and the history of Darwinian evolution were more difficult.
- Applying understanding of the cause of seasons to an understanding of the cause of climate zones is more complex. Roughly 50% of students were able to make this more complex application of the relative theory to everyday life on Earth.
- Not all students could identify mineral chemistry and relate it to occurrence in the physical Earth. For example heavier, iron and magnesium rich minerals are more abundant in the Earth's mantle than the crust.
- Not all students understood the nature of linear versus exponential growth.
- Some students were unable to differentiate between convergent plate boundaries and divergent plate boundaries.
- Some students clearly had no understanding of the environment in which dust samples were taken (in our solar system, but far from Earth), typically indicating that the probe collected samples well outside our solar system.
- Students demonstrated Incomplete understanding of pH.

Comments pointing to particular learner weaknesses that could be present in other classes as well

- In forwarding hypotheses on their own, some students did not submit a complete and clear hypothesis.
- Mathematics is a struggle for some students. So is showing up to class or turning in assignments.
- Not all students were willing to identify trends and interpret the data.
- Some students were unable to make connections.
- Some students don't participate significantly in group discussions.
- Some students did not participate in the activity or were unwilling to justify their interpretations.
- In the final lab, students were asked to summarize differences between coal, oil, and nuclear power plants. Several students copied a few lines from the book without thinking much about them.

Proposed changes

Specific teaching strategies

- I am developing a pre- and post- test addressing and accessing the students growing knowledge of scientific theories for the Fall 2016 semester.
- I am developing a work-shop on data analysis for the next time this course is offered. I have developed a pre- and post- test addressing and accessing the students growing knowledge of scientific theories for future classes.
- Frankly, students often need to be introduced to an idea, let it soak for a few months, and then try again.
- Have the students do a lab where they measure the density of different igneous rocks. For example, having students measure the density of granite, a common less dense rock found in continental crust and compare this density value with that of gabbro, an iron-rich, dense, igneous rock that occurs in the oceanic crust.
- Perhaps periodic in-class peer-sharing activities that require students to state and define terms would help. The class is a large lecture class so student participation is difficult to enforce. However, activities geared to understanding concepts and their related ideas could be reinforced later in the course after the material has been introduced.
- The course was taught in the peer instruction format. I enjoy this approach, but a significant fraction of the class does not participate much of the time. Since I use voting cards rather than clickers, I cannot enforce participation and attendance. Perhaps improving participation will improve student performance. I will discuss this further with colleagues who use clickers.
- I didn't spend much time going into the "how we know it works this way" background, which may be needed. I tend to focus on the vector relationships that have been developed, and how to visualize them, as opposed to developing the laws from "logic". Even still, students do struggle with translating equations into visualizations. They also tend to have difficulty recognizing when their arguments are circular or inconsistent.
- I tend not to focus on the wider topic of what constitutes a "model" in science, which may be needed. It isn't clear that students need direct instruction on this, but seem to need much more practice and correction applying details. This seems to be true in electricity and magnetism, which is often very strange/new to most students. I will have to do some more thinking on the best way to improve student learning about incorrect/correct uses of a model or relationship, but some has already been incorporated into in-class questions and activities.
- Incorporate practice activities prior to this lab.
- I am developing a work-shop on data analysis for the Fall 2016 semester.
- I have developed a pre- and post- test addressing and accessing the students growing knowledge of scientific theories for future classes.
- This honors class is taken predominantly by non-science majors. Even for science majors, who get to practice error analysis across several classes, uncertainty is often approached as an afterthought. Clearly, a simple, clear analogy regarding measurement uncertainty is needed, and must be continually reinforced throughout the semester.
- Perhaps giving students an example paragraph of a good student report dealing with a surprising result would be helpful. This might be contrasted with an example of unacceptable work.
- Further questions of the type used on the final could be used on weekly assignments. I also think the Softchalk platform as it is currently being used makes it too easy for students to click until they get the right answer, without reading and understanding the feedback. I will look at revising the way questions are given to students so that a wrong answer triggers a conference with me or the LA (learning assistant), or at least that only

students get 2 max attempts so that they have an incentive to read the feedback given if the first attempt is wrong.

- I provided a model using the entire data set as example prior to this lab. In the future, I also provided fill-in-tables for ranges and averages and reworded the questions. In the future I could have them practice with example data first. The individual part of the lab was a take home exercise, but many students did not complete this portion. Next time I could break this into 2 in-class labs.
- NOTE: Assessment of this goal was based on one question in an online project. The project was one of several from which the students could choose, so the number in the assessment of this SLO is lower than the others. Our lab activities and projects tend to focus on the specific task we are asking the students to do, not on the broader context. That could perhaps be addressed by adding a question to each lab in which they reflect on how what they have done fits in with the broader themes of the course.
- A map activity to refresh student's geographic knowledge. Utilize Google Earth to investigate the terrain associated with different plate boundaries.
- Some class discussion about the importance of reports and reporting units might be helpful.
- Next semester, it might be possible to bring back the oral debate portion.
- There were several multi-part experiments that students needed to write up. Many of them were disorganized and difficult to follow. It may improve understanding by providing an organized template.
- I think going above and beyond the course materials can only enhance the course. Students are able to connect all the dots between chapter course topics but also think about the ever-changing topics that are brought to light in the news so they can understand and appreciate what they are learning. As for me, I would continue to not only teach the course material as laid out in the syllabus and in the text book, but actively seek out relevant, interesting and informative material to bring to the class every day.
- Have students measure the pH of common substances such as lemon juice, tap water, soapy water. Predator prey activity to demonstrate primary producers and the food chain (basic ecology).
- Perhaps the term "summarize" used in the assignment gave students the impression that their own thoughts were not important. Perhaps wording the lab differently would result in more thoughtful responses.

Do "more of this":

- More emphasis could be placed in lecture tutorials and lab activities on the "testability" of ideas.
- Spend more time in lectures and assignments noting the nature of theories
- Engage students in more example exercises of more field opportunities, however, that is probably not practical.
- Spend more time emphasizing the important theories for the Earth Sciences.
- The current assessments are too fact based. More authentic, context-rich assessments would be needed for more accurate assessments.
- More instructions on what the trends in the data may be telling us.
- More practice with creating linear and exponential growth graphs and analysis of demand for Earth resources.
- The one possibility is to do more formal error analysis in the lab setting.
- It may help to have more exam questions that relate to interpreting graphs and discussing quantitative relationships. Currently, exams predominantly cover the lecture content of the course. Having more questions of this type on the exam should improve student skills in this area.
- The experiment assessed needed very simple equipment and measurements. The difficulty students had with it indicates many of them really try to get through lab by mimicking steps they don't understand. The curriculum has many similar experiments that we don't carry out (although we do some similar ones later). It may be that we want to have students do more of these "simple" experiments that require understanding.
- This course does not emphasize formal writing or formal oral reporting. That could be emphasized more, although at the cost of other aspects of the course.
- More specific example reports might help (although I provided some). Another solution is more feedback-- however, for this class I found myself overbooked in time even for the feedback I offered, so this is not a realistic

solution unless provided a couple of SAs (student assistants) for the class to help guide with both experimental interpretation and writing (which is stretching the limits of most SAs' abilities).

- It may be prudent to require more writing in lab 2, and provide more structure as to how a report is organized.
- Again, more feedback and examples for students to emulate would be great, but not realistic given financial and time constraints
- I wish we had gotten to chapter 6, Gas Laws. Gas laws, and the corresponding Kinetic Molecular Theory give the best combination to address the ideas and relationships of theories and laws within a single context.

Faculty "wish" list (ask for things to happen or resources to be delivered outside an individual faculty's control)

- While we do illustrate concepts using gas laws, diffusion and kinetic molecular theory, and the Law of universal gravitation vs. theory of relativity, none of these laws or theories is integral to the BOT or Mn Academic Standards in Science which are the two primary driving forces of content. While these ideas could be further explored in lecture, there are only 14 lectures all year and spending more than 1 lecture is a disproportionate amount of time on this concept.
- They should be exposed to historical earth science in high school--that they are not is a travesty.
- Students need to encounter an idea multiple times, in multiple contexts, from multiple faculty/courses.

Other notes

Although comments to this effect have been removed from the areas above, some faculty focused on what they were doing in their classes, instead of on the assessment of their students. Some faculty prefaced their statements with "I believe I am doing a good job here", or "this is helping students" without really giving any specific evidence.

Also, some faculty resorted to terseness with such phrases as "learning was evident on the exam" (or some other assessment instrument). It is far better to be clear about specifics: what did you see on the exam that was improved? A grade distribution (X # of A's, etc.) is minimally helpful in elucidating what students are learning from the course in relation to the SLOs.

LASC AREA: 4, Mathematical/Logical Reasoning

YEAR: 2015-2016

Total Number of Reports: 18

Classes: MATH 105 (1 sct.), MATH 110 (5 scts.), MATH 127 (4 scts.), MATH 210 (2 scts.), MATH 229 (1 sct.), MATH 234 (3 scts.), MATH 261 (2 scts.)

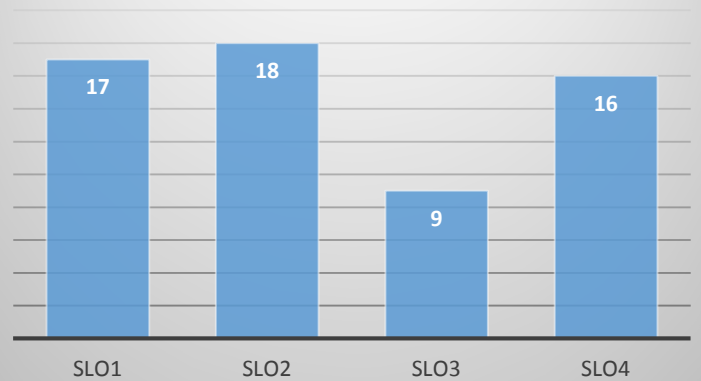
Delivery: Hybrid = 0, Face to Face = 17, Online = 1

Total Number of Students: 772

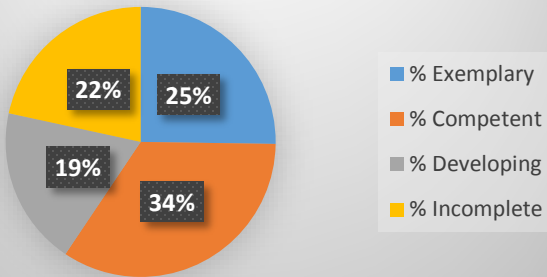
Basis of Assessment:

- Multiple Choice: 2
- Short Answer: 14
- Essay: 2
- Paper 1-5 pages: 1
- Paper 6-10 pages: 0
- Paper 11-15 pages: 0
- Individual Projects: 1
- Group Projects: 0
- Individual presentations: 0
- Group presentations: 0
- Individual labs/activities: 2
- Group labs/activities: 3
- Other: 1, math problems and applications; 1, math problems and applications on exam; 1, homework assignment; 1, quiz on homework

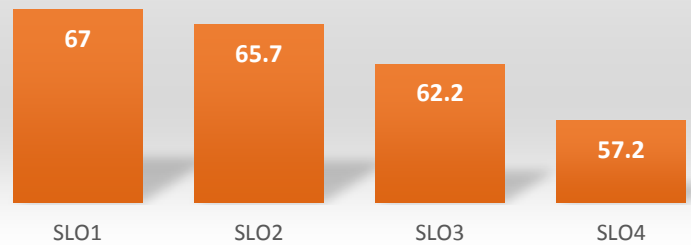
Number of Classes Assessing Each Outcome



% of students at each level overall



Percent of Students Achieving Exemplary or Competent on Each SLO



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	% Exemplary	% Competent	% Developing	% Incomplete
N of classes assessing	17	18	9	16				
Mean % pass/average	67	65.7	62.2	57.2	26.3	35.6	19.8	22.5
St.Dev.	21.4	19.5	18.6	28.1	17.3	16.5	11	18.4

Changes/innovations to the class

- Faculty say this is the first time the course was offered or the first time they taught this particular course (mentioned 3 times).
- The online format has been updated according to the workshop on improving existing online courses alignment to Quality Matters Standards.
- The computational mastery exam protocol is working better -- there was better access to times to retest.
- Mastery quizzes were introduced. Students retake a quiz on a specific topic till they get a satisfactory result (80% or 90%).
- Incorporation of individual project as part of course and assessment.
- Learning assistants were used for the first time in the course.

Ways in which learning was most evident

The “best” comments from faculty discussed general competencies, followed by an example of how the faculty saw students accomplishing this competency. Less helpful, but still revealing quite a bit about what students could do, were statements about specific tasks that students learned how to do. Comments are divided into these two categories below.

Statements that relate to SLOs:

- Students could apply mathematical concepts in solving contemporary problems. Students demonstrated understanding of various applications.
- Students’ demonstrated ability to understand probability and statistics applied to real life situations.(mentioned 3 times)
- Students could complete typical example problems.
- Students did a good job of identifying which application strategy was appropriate to use in a given context.
- Some students were able to explain clearly in writing the sequences of graphical transformation of functions by journaling and actually perform the transformation effectively .
- Students demonstrated ability to revise and improve written assignments.
- Students who showed mastery demonstrated a high level of fluence in both mathematical formal symbolic representation and an ability to translate these expressions into clear written English and to correctly negate statements both in symbolic and plain English forms.
- Some students were able to write individual reports on a class project that involved simple linear regression.
- Students learned to take the results of solving a mathematical problem and interpret them in an application.
- Students demonstrated: ability to interpret the result of statistical analysis such that confidence interval and hypothesis tests; ability to use and interpret statistical terms such as test statistic, p-value and margin of error

- Students were asked to find the inverse of a function and to verify that the function and the inverse found are truly the inverse of each other. The ability to perform this task is an evidence of student learning.
- Students demonstrated the ability to apply a sequence of logical steps to solve a mathematical problems like finding the zeros of a polynomial of degree more than 2 or sketch the graph of a function by applying a sequence of transformations.
- Students could write a proof. Students who met this standard were able to write a clear and correct mathematical proof with all or most of the details correct. Those with the highest level of mastery were able to demonstrate mastery of more than one proof method.
- Students demonstrated the ability to use several Theorems from Calculus to sketch a graph of functions or to solve an application problem.
- Some students showed excellent use of problem-solving strategies.
- Students were given two application problems that involved investments over a period of time. The goal was for students to apply analysis, synthesis, and evaluation (checking the reasonableness of their solutions) in solving these problems. Many students succeeded.
- Students were able to express their ideas and support the numerical answer by computational/logical arguments.
- Students who met this standard were able to apply higher order problem solving skills in order to solve problems related to pattern recognition, finding a recurrence relation, determining whether or not two combinatorial graphs are isomorphic, and solving problems using a decision tree to carry out a testing procedure in an efficient way.
- Students were able to run a regression analysis based on data set presented to them to determine whether or not there is significant relationship between cigarette smoking and coronary heart disease. They were also able to present their findings in writing.
- The students' ability to compute a complicated derivative using only the definition was evaluated. This requires the students to apply the algebra skills that they have and think about how to eliminate a particular factor in order to finish. Those who are willing to persist and be creative do fine.
- The students made an excellent use of their collaborative skills.
- Students demonstrated the ability to compute probability of random events with certain distributions, such as Poisson and binomial distributions

Specific types of activities that students could demonstrate ability in:

- Students demonstrated ability to create a Venn diagram that represents the results from a survey. (mentioned twice)
- Students demonstrated ability with Mathematics of Voting / Fair Division problems.
- Students had the ability to apply set relations to compute probabilities of unions, intersections, and complement of random events.
- Students demonstrated ability to use mathematical formulas and rules to solve equations and find the zeros of functions by using the quadratic formula and the intermediate value theorem
- Students demonstrated the ability to set up and solve an optimization problem and the ability to find the inverse of a matrix.
- Students began to understand how to use the relationship between derivatives and integrals of functions and use them to answer questions about function behavior.
- Students could solve optimization problems and sketch a graph of a function.

Ways learning fell short

Again, the most useful comments from faculty related to the SLO, and also gave some specifics. A second category of comment discussed a particular math algorithm or area that students struggled with. A third category of comment pointed to a particular weakness in the learners.

Statements that relate to SLOs:

- A number of students did not use a systematic approach such as tree diagram to help organize the information which resulted in wrong answer.
- A number of students struggled with being able to adequately interpret word problems and translating them into mathematical expressions and then solving them.
- Some students struggled with interpretation of statistics
- Some students struggled to correctly apply the strategy once it had been identified or misinterpreted the context clues and applied the wrong strategy or an ad hoc method that was unsound.
- Students struggled to use proper notations for sets, random events or probabilities (mentioned 3 times)
- Students did not present all their thoughts on paper: half of the processes were done mentally and what they had on paper did not follow a logical sequence. (disorganization in thought processes mentioned twice)
- Students did not effectively connect mathematical skills with their written work.
- Some students could communicate in writing the sequences of transformation but could not actually perform the process in drawing while others could not understand the process especially when it deals with using multiple transformations to graph a function.
- Of the students who did not meet the standard, some struggled to understand the conceptual difference between the different logical connectives. More had difficulty expressing mathematical concepts in clear written English or did not negate the statements properly.
- Students were able to run the regression analysis using an Excel or a Minitab software without much problem. However, they struggled with reporting their results.
- Some students had the inability to use simple words to explain the result of a statistical analysis.
- The inability to carry out the verification part. Students were able to find the inverse but many did not bother to check to make sure the two functions are inverse of each other.
- Many students were not able to follow the correct sequence of steps that lead to the correct conclusion.
- Students who did not meet the standard were able to understand why a given proof method works and could follow the individual steps, but were unable to create their own novel proof.
- These connections are complicated and require higher order thinking. Some students had trouble making the leap from the theoretical to the practical.
- Some students struggled with the analysis and adequately presenting problems using Venn diagrams, hence their inability to arrive at a correct solution.
- Students were not able to choose correct strategies to solve problems: e.g. they only attempt one problem-solving method, with no evidence of considering other strategies.
- Some had inability to abstract strategies to problems that do not sound similar at their surface level.
- While students did well on applications that were similar to those that they had practiced and/or seen before, they struggled to come up with methods to solve problems that were novel or that required known methods to be extended or modified.

Specific types of activities that students struggled in:

- Some had a difficult time with "Lone Chooser" method.
- Many still could not correctly explain "fair share" or the significance of the "fair voting criteria" studied

- They were able to write about descriptive statistics but were not as competent writing about inferential statistics
- Some students could not set up the function that needed to solve the optimization problem. Some students confused the inverse of a matrix with with a solution of a system of equations.
- Some students were not able to put all the needed steps to sketch the graph. Some students had difficulty giving the modeling function for the application problem.
- Demonstrated inability to compute certain probabilities, for example probability of at least or at most a certain number the random variable can occur. Inability to compute Poisson and binomial probabilities.

Comments pointing to particular learner weaknesses not tied to SLOs

- Not attending enough classes and not doing homework (mentioned twice)
- A number of students struggled with word problems because they could not make necessary connections. Part of the reason being that they did not seek help from tutors or the instructor of the class. Many also skipped classes.
- Some students take a long time to set up the equations and formulas. (time to complete tasks was mentioned twice as a problem)
- Many students decide that solving word problems is too difficult and choose to just not learn how, and so do poorly on these types of questions throughout the semester.
- Sometimes there may be some stress in taking exams or not optimizing the time students scheduled for studying.
- Some students didn't want to learn applications out of their field of interest. (mentioned twice)
- Some students didn't have a good knowledge of high school mathematics. (lack of prior preparation adequate to succeed was mentioned twice)
- A number of students struggled with hypothesis testing. They also struggled with differentiating among sampling distributions and other probability distributions. Again, this is partly because students did not seek help from tutors or the instructor of the class. Many also skipped classes and it was difficult for them to catch up since concepts build on previous concepts covered..
- Students missed the purpose of the exercises, often by failing to read instructions. (mentioned 3 times)
- Students try to mimic what has been seen in class/homework.
- The high percentage of students in the class for whom English was not their native language made this area hard to decipher - were they struggling due to the language or due to the concepts?
- Many students often took multiple attempts to get to competency level.
- Irregular attendance affected this area (mentioned twice).
- Students seemed unclear as to how to begin.
- Most of the students who did not complete correctly the assignments did not take advantage of office hour and tutoring opportunities.
- For some students it was difficult to learn new techniques and methods that will complement their previous knowledge of college algebra.
- Not participating in discussions in class
- Many students were not willing to persist on these kinds of problems. They get bogged down and became fearful so quit.

Proposed changes

Very few of the proposed changes actually addressed curriculum. The first set of comments categorized below were more along the lines of teaching strategies that the faculty would attempt. The second category simply notes what the faculty believed they needed “more” of, either for the students or themselves. The last category were comments meant to address weaknesses in learners in general.

Specific teaching strategies

- Students covered four major content area including algebra, set theory, probability and statistics, each of which is enough to be a whole semester’s course. Hence moving from one content area to another is problematic for a number of students. Address only the important things that students need to know instead of trying so much within a short period may be a good strategy.
- In the future, we should develop more assignments that ask students to choose between multiple strategies in order to solve application problems (prior to the cumulative exam) -- we have had too much of a focus on learning and mastering individual strategies one at a time.
- Share strategies with other faculty on how to differentiate those notations.
- Insist that students provide clear explanation in all homework problems. Be very strict in making sure that homework problems are presented in an appropriate format to catch their mistakes early enough. Also, a clear explanation of expectation should be communicated early enough.
- Maybe incorporate technology in teaching function transformation. Demonstrating with graphing calculators such as Desmos may help students to see how the graph of a parent function changes with specific transformation. That may help them to communicate clearly in writing the process and actually draw the graphs.
- Continue to give simple optimization problems that can be developed into a harder and harder ones, like the fence problem. Give one matrix that appear in a system of linear equations and ask the students to solve the system and find the inverse of the matrix, then they see the difference.
- Provide guided notes on how to write reports based on statistical analysis.
- Provide guided notes to help students and insisting that each time students find the inverse of a function, they must always verify that the two functions are inverse of each other
- Group students in teams and encourage them to interpret the questions to each other.
- Have them complete work in summarizing the rules that are need to finish a solution of a specific problem.

Do “more of this”:

- Use more applied examples and visual aids.
- Practice would be helpful here too. Start demanding the students do more complicated computations more often.
- We need to give students more opportunities to work on problems that modify and extend known methods in addition to just mastering familiar techniques.
- Provide more structured complex problems that will force students to follow required and specified approach.
- More practice problems/more practice in general (mentioned 7 times).
- Continually model and reinforce various problem-solving strategies.
- Find more appropriate online practice.
- We should spend a little more time at the end of this unit discussing the differences in meaning and use of each logical connective once all of them have been introduced, and we should include a few more translation exercises between symbolic and plain English forms.
- Redo explanation lecture with more visual diagrams.
- I intend to use more appropriate assessment tools next semester as well.
- Include more interpretation of data sets within context.
- The students will be given extra homework problems and quizzes.

- Exposing students to more application problems that would be relevant in their life. Using more real-life problems that students can identify with.
- Incorporate writing more frequently and earlier in the semester. Give feedback early in semester.
- Include more exercises with more emphasis on inferential statistics.
- Making the grade more dependent on their output .

Items to address learner weaknesses:

- Explain the importance of taking notes in class and doing homework.
- Encourage and more push students to use tutoring facilities available to them.
- Maybe give some simple reading assignment.
- Placement test to screen students who take this class.
- I used different strategies to encourage students to come to class regularly, even assigning points for attendance.
- Give students a sense of purpose for learning and demonstrating these skills. Give specific feedback early in the semester. (mentioned twice).
- Make sure students have better preparation before taking this class (mentioned twice).
- Make sure students know what kinds of help are available.

Other notes

In stating “evidence” for learning or lack of learning, some faculty simply restated what assessment instrument they used. Stating that learning was evident (or not) on “presentations, exams, and assignments” does not really help pinpoint areas for future change or improvement.

It was also interesting to note that quite a number of comments revolved around learner weaknesses and how to overcome these, rather than focusing on the particular SLOs and how the course could better address those. These types of comments can still be extremely helpful in determining how to improve our students’ learning.

LASC AREA: 5, History and the Social and Behavioral Sciences

YEAR: 2015-2016

Total Number of Reports: 18

Classes: HIST 205, POL 120, WS420, PSY 113, GEOS 310, GEOS 310, HIST 105, HIST 304, ANTH 115, SOC 110, ECON 204, POL 221, ECON 202, ECON 204, SOC 120, HIST 122, ECON 204, SC210

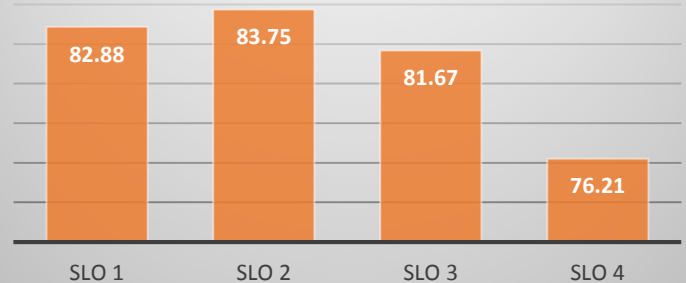
Delivery: Face to Face = 18

Total Number of Students: 1634

Basis of Assessment:

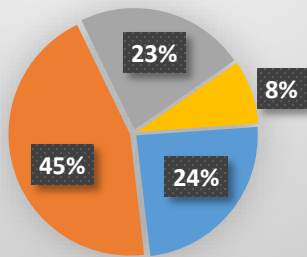
- Multiple Choice: 12
- Short Answer: 7
- Essay: 6
- Paper 1-5 pages: 11
- Paper 6-10 pages: 4
- Paper 11-15 pages: 3
- Individual Projects: 1
- Group Projects: 2
- Individual presentations: 1
- Group presentations: 1
- Individual labs/activities: 1
- Group labs/activities: 0
- Other: 0, in-class activities and written debates/discussions.

Percent of Students Achieving Exemplary or Competent on Each SLO

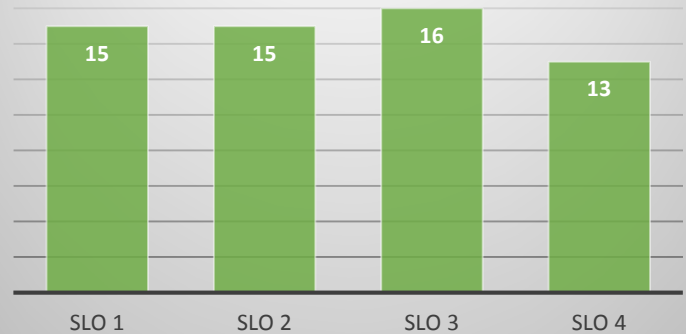


% of Students at Each Level Overall

■ %E OVERALL ■ % C overall ■ %D overall ■ %I overall



Number of Classes Assessing Each Outcome



Student Learning Outcomes:

	SLO 1	SLO 2	SLO 3	SLO 4	%E	%C	%D	%I
N of classes assessing	15	15	16	13				
Mean % pass/average	82.88	83.75	81.67	76.21	24.3	44.7	22.6	8.5
Standard Dev.	8.64	15.41	12.47	14.25	17.13	17.04	12.71	6.07

Changes/innovations to the class: Of the 18 respondents, 12 have made either no changes or are new to the course they were teaching. Of those twelve 2 were new instructors to the course while 10 made no changes. Of those who made some degree of change, the choice was often related to enhancing existing exams by adding more short answer questions or re-assessing existing questions to ensure that they were designed well and aligned to course objectives.

Ways in which learning was most evident: Across SLO's 1-4 in the context of LASC 5, students were challenged and demonstrated the ability to think critically and historically, apply historical research methods effectively, the ability to research and synthesize data and information, the ability to compare and contrast data, and demonstrate their understanding by doing short answer tests and in-class presentations discussing the lessons and key concepts of that day's reading. Additionally, students demonstrated their ability to understand and apply alternative theories and principles towards human rights issues, inequality, and perspectives of injustice. They did this by leveraging and applying various models, comparing and contrasting theoretical paradigms, and explaining their perspectives and understanding of the perspectives of others. Unfortunately, there were a number of respondents who indicated that either there was no evident learning as indicated by blank responses or an entry of "NA" in their responses. Finally, some respondents provided un-insightful two word responses that may indicate a lack of attention and/or effort applied to the exercise.

Ways learning fell short: Generally, the respondents indicated that there were issues with the ability of students to apply what they have been taught. This was made evident by reports of students struggling with the applying of models, theoretical frameworks, and conceptual lenses to real world challenges. Another challenge made evident was the ability to explain their perspectives and views as it pertained to theoretical concepts. This was reportedly due to issues with the students' writing ability in some cases and a clear lack of content mastery in other examples. A final observation of the respondent data was a 28% response of "NA", blank, or "none". What can be inferred from this is open to debate.

Proposed changes: Those who suggested changes indicated that they would not only take more time on difficult topics, but also go more slowly through difficult concepts early on and provide additional learning opportunities (resources, assessments, and hands-on classroom activities) to better grasp core concepts earlier in the semester. Another common suggestion for improvement was to take a more recursive approach to key concepts covered throughout the semester. For example, some of the respondents indicated that they would come back and re-engage core concepts covered earlier in the semester in an effort to improve recall, re-engage those topics in light of what has transpired in class since their initial introduction, and provide multiple opportunities to engage with key topics before the end of semester. A final suggested changes a number of the instructors indicated they would take was to increase the number of opportunities for student-to-student dialog and unpacking of difficult concepts. Unfortunately, 43% of the respondents indicated either a response of "NA", "none", or blank. Additionally, there was one response that implied that the change needed to come from the high school the students attended while another said that they would simply make sure the students have read book and completed the study guide.

Other notes: One class had no % passage for SLO1 while two classes had no % passage for SLO2. Additionally, there were some respondents who either consistently didn't provide any of the details requested for each SLO or they provided vague or shallow feedback.

LASC AREA: 6

YEAR: 2015-2016

Total Number of Reports: 21

Classes: COMM 310, COMM 310, ENGL 183, ENGL 202, ENGL 445, ENGL 445/545, English 202, English 282, English 317, English 407, HUM 101, HUM 211, MUS 111, MUS 111, MUS 215, PHIL 101, PHIL 311, PHIL 318, WS100, WS247, WS269

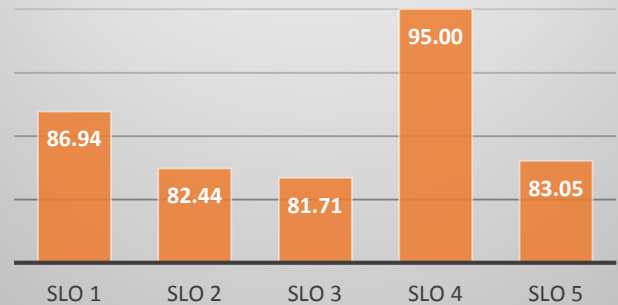
Delivery: Face to Face = 15
Online=6
Blended=1

Total Number of Students: 758

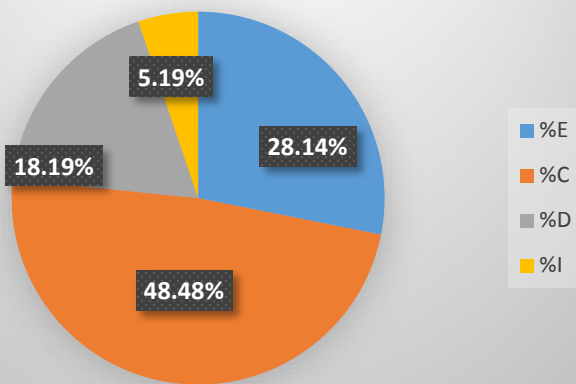
Basis of Assessment:

- Multiple Choice: 11
- Short Answer: 11
- Essay: 10
- Paper 1-5 pages: 15
- Paper 6-10 pages: 4
- Paper 11-15 pages: 0
- Individual Projects: 0
- Group Projects: 2
- Individual presentations: 3
- Group presentations: 3
- Individual labs/activities: 2
- Group labs/activities: 2
- Other: 0, in-class activities and written debates/discussions.

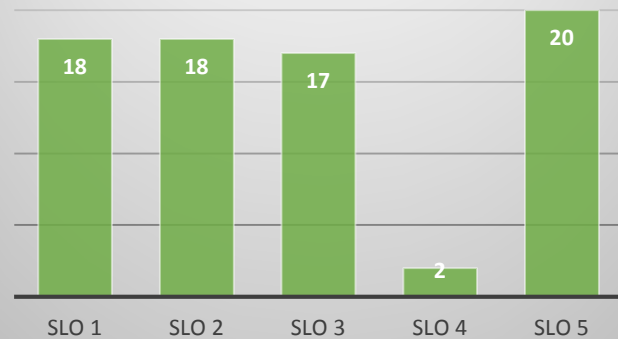
Percent of Students Achieving Exemplary or Competent on Each SLO



% of Students at Each Level Overall



Number of Classes Assessed



Student Learning Outcomes:

	SLO 1	SLO 2	SLO 3	SLO 4	SLO5	%E	%C	%D	%I
N of classes assessing	18	18	17	2	20				
Mean % pass/average	86.94	82.44	81.71	95.00	83.05	28.14%	48.48%	18.19%	5.19%
Standard Dev.	25.08	15.05	16.79	7.07	21.72	20.79	17.87	9.50	6.08

Changes/innovations to the class: Of the 21 respondents, 48% have identified that innovations were not applicable to a particular SLO in the context of their course, not solvable by higher education, not able to be assessed completely in their course, or they were left blank. Some of these also included erroneous commentary that did not provide value to this assessment. Additionally, 8 of these included the sentiment that there was not a required change to the curriculum in their classroom but rather an improved high school experience. Finally, 4 respondents indicated, "I do not believe any one course can every accomplish this."

Of those who made some degree of change (or plan on making a change), many instructors have included more clear instructions to their students, planned on utilizing the library to better equip their students to do research, and provide examples of exemplary work for their students to better understand what the instructor is looking for. Other instructors plan on refocusing or expanding their curriculum to help students understand the concepts of "historical and societal contexts", including more student-to-student interactions through classroom or online discussions, provide more opportunities for meta-reflection, and challenging students to operate at higher levels of Bloom's Taxonomy.

Ways in which learning was most evident: Across SLO's 1-5 in the context of LASC 6, students were challenged and demonstrated the ability to think critically and historically, the ability to synthesize data and information, the ability to compare and contrast data, and demonstrate their understanding by doing short answer tests, meta-reflections, group-discussions, classroom presentations, essays, and through attendance at live performances followed by reflective essays. Additionally, students demonstrated their ability to understand and apply alternative theories and principles towards human rights issues, inequality, societal power dynamics, and perspectives of injustice. Amongst the respondents in LASC 6, there were numerous success stories and detailed examples of success where many of the respondents reported not only the fact that they have been effective but the exact techniques used.

Ways learning fell short: Many of the 21 respondents indicated that a number of students struggled with understanding and applying concepts in their broader historical and social contexts, thinking critically and writing critically, and making connections between concepts that would empower them to engage with material more broadly and critically (both self-critical and concept-critical). Additionally, many of the respondents reported fragmented knowledge of students because of poor attendance and in-class engagement. This might also contribute to the narrative related to struggles with applying and recognizing concepts within the proper contexts. Respondents did a great job providing insight into the areas where improvement might be needed. In this category there were only 15% of the responses across the SLOs that were blank or reported to be "not applicable".

Proposed changes: Of the 21 respondents, 9 indicated that this was the first time they have either taught the class or the first time they have done an assessment such as this for that course. 8 of the 21 respondents indicated no changes or that any changes were considered "not applicable" in the context of LASC 6. The 4 respondents who did indicate some kind of change, those changes were really subtler changes to the number or types of assessments and expansion of their curriculum.

Other notes: There were a number of respondents who indicated 100% passing of their SLO's in LASC 6 while still reporting some level of deficiencies. Additionally, many of these same respondents indicated no changes to their curriculum in terms of improvements. Of particular concern was one specific respondent who (for their 3 courses assessed) indicated that the areas for improvement were not theirs but either deficiencies on the part of the student or the high schools they came from. The lack of any kind of culpability is concerning.

LASC AREA: 7, People and the Environment

YEAR: 2015-2016

Total Number of Reports: 9

Classes: AMCS 233 (Only Kim Park Nelson’s sections), ANTH 110, ANTH 327, FILM 371, GEOS 111 (x2), PHIL 120, WS 100, WS 247.

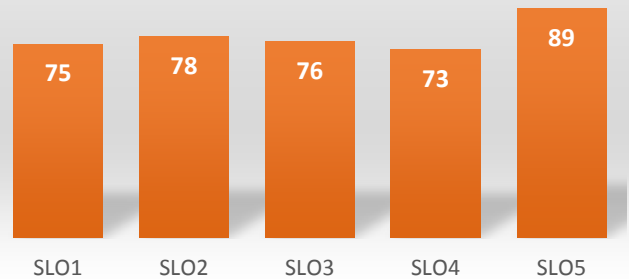
Delivery: Hybrid = 0, Face to Face = 8, Online = 1

Total Number of Students: 508+ (2 classes did not provide an N).

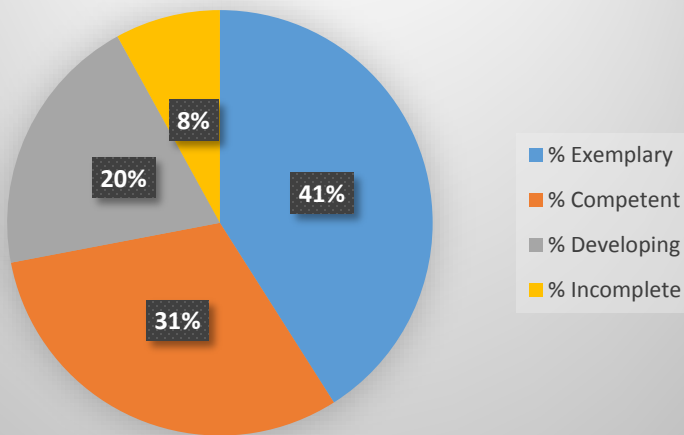
Basis of Assessment:

- Multiple Choice: 3
- Short Answer: 5
- Essay: 5
- Paper 1-5 pages: 6
- Paper 6-10 pages: 1
- Paper 11-15 pages: 1
- Individual Projects: 0
- Group Projects: 1
- Individual presentations: 1
- Group presentations: 1
- Individual labs/activities: 1
- Group labs/activities: 0
- Other: 2, self-assessments & extensive use of maps

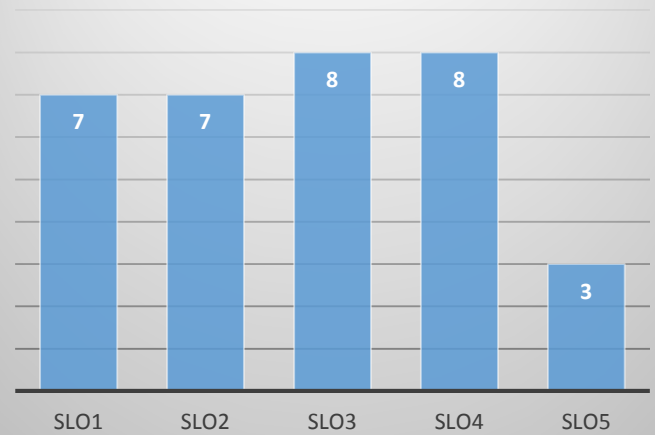
Percent of Students Achieving Exemplary or Competent on Each SLO



% of students at each level overall



Number of Classes Assessing Each Outcome



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	SLO5	%E	%C	%D	%I
N of classes assessing	7	7	8	8	3				
Mean % pass/average	75	78	76	73	89	41	31	20	8
St.Dev.	20	19	21	20	3	26	11	12	7

Changes/innovations to the class: One instructor added a self-assessment, another changed books. Neither indicated that the change was assessment/data driven. The rest of the instructors either did not answer the question or did not make changes, although some indicated this was their first assessment report.

Ways in which learning was most evident: The majority of faculty answered this question correctly, and were able to point to concrete examples, typically in essays or other extended response assessments, where students successfully demonstrated each SLO. For example several talked about the student reaching a deeper understanding of his or her own culture or group, and the inherent bias that this can bring when viewing other cultures. Furthermore, several faculty commented that students were able to understand a particular group (women, LGBT, a foreign culture) while avoiding judgment. Many students were also able to talk about power and privilege.

Ways learning fell short: Examples of the way learning fell short typically mirrored the way learning was most evident. For example, some students did not recognize their own bias and engaged in nationalistic thinking or cultural relativism. In at least one class, struggles were explicitly linked to the culture of the student "Students of certain cultures tend to be less aware of their own identity and bias." There were also some very specific misconceptions (Mexico has a Native American, as opposed to Spanish/European, origin or sexuality vs. gender identity). One theme that appeared was that students could often come to terms with another way of thinking (Feminism) or another country/culture, but failed to appreciate that nuances existed within this other. For example some students struggled with the idea that racial tension or LGBT struggles exist in other countries and may take on different dynamics in that culture.

Proposed changes: While 7 of the 9 answered these prompts, there were few concrete proposed curricular innovations mentioned.

In general, the concrete innovations found a specific area of weakness (e.g. understanding of Eastern religions < Abrahamic religions) and proposed a specific solution (new readings, more time, more discussion, a guest speaker) to strengthen instruction in this area. In some cases, increased intentionality on the part of the instructor to revisit themes throughout the lesson/course rather than just at the beginning and/or end were discussed.

Other notes: Only 3 of the 9 classes actually assessed SLO5. It would appear that this SLO is not being widely taught at the moment.

LASC AREA: 8, Global Perspective

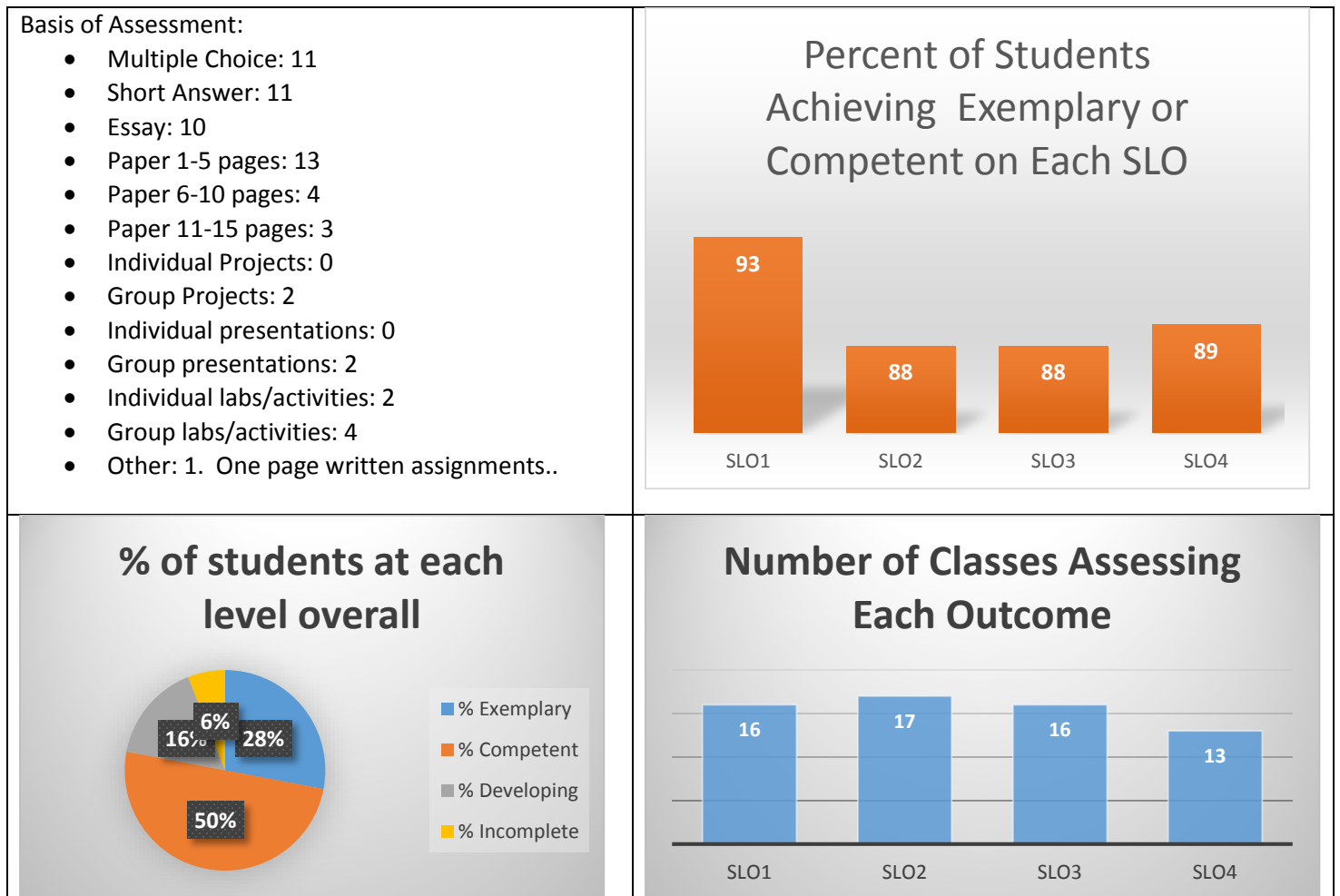
YEAR: 2015-2016

Total Number of Reports: 17

Classes: ART 234, ANTH 306, ANTH 316, COMM 324, ECON 300, ENGL 317, FILM 280/280S, HIST 304, MUS 316, SPAN 101, SPAN 102 (2 sections), SPAN 201, SPAN 202, WS 269, WS 420.

Delivery: Hybrid = 1, Face to Face = 15, Online = 1

Total Number of Students: 579



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	%E	%C	%D	%I
N of classes assessing	16	17	16	13				
Mean % pass/average	91	88	87	89	28	50	16	6
St.Dev.	10	13	13	14	27	27	14	6

Changes/innovations to the class: All but one instructor reported no changes. One instructor indicated that the class added writing intensive requirements and now requires multiple papers (but there was no evidence that this change was related to previous assessments).

Ways in which learning was most evident: Integrating music, culture, economics, politics and/or history into a single cohesive paper or presentation. Students were able to recognize social, cultural and religious differences. It was noted that cultural issues were not discussed. Unfortunately, many faculty chose to answer this question as “on which assessment was the learning evident” and answered “quizzes”, “discussions”, etc. Worse, some listed the lectures and readings as the way learning was most demonstrated.

Ways learning fell short: The language instructors in this LASC area frequently emphasized that student did not fall short, but it was also clear that the standards themselves were not actually addressed. “Cultural problems per se where not discussed” is not actually addressing a student learning outcome that states “Analyze specific international problems, illustrating the cultural, economic, and political differences that affect their solution.” In the cases where areas for improvement were noted, escaping Western bias and naivety about other culture were noted.

Proposed changes: There were a few proposed curricular innovations mentioned.

- Use of case studies to humanize the statistics of an issue.
- “None. The fact that students are learning the language in itself fulfills the expectations.”
- “Analyzing specific international problems is not the goal of a ... language class; hence, no changes are necessary.”
- More feedback, examples earlier in the course.

Other notes: Finally, in one case, it was virtually admitted that the student learning outcome was not well addressed “there is only so much culture per se that one can convey within a curriculum whose goal is to achieve language proficiency.” There is a large variation in reported proficiencies (91% exemplary to 5% across classes) which brings into question the usefulness of the data.

LASC AREA: 9 Ethical and Civic Responsibility

YEAR: 2015-2016

Total Number of Reports: 12 (9 classes represented, 2 reports each from ENG 445, CSIS 316 and PHIL 311)

Classes: ART 345, BIOL 406, CSIS316, ENG 445/545, PARA 201, PHIL 311, POL 120, POL 221, WS 415

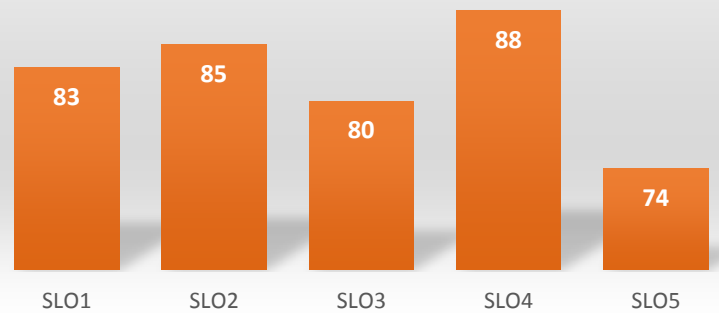
Delivery: Hybrid = 1, Face to Face = 7, Online = 4

Total Number of Students: 553

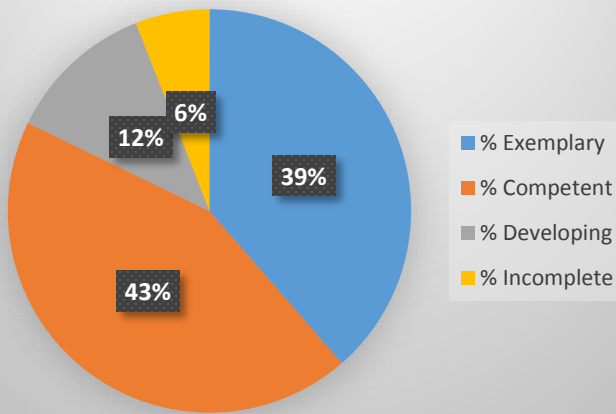
Basis of Assessment:

- Multiple Choice: 7
- Short Answer: 5
- Essay: 6
- Paper 1-5 pages: 6
- Paper 6-10 pages: 4
- Paper 11-15 pages: 2
- Individual Projects: 2
- Group Projects: 0
- Individual presentations: 1
- Group presentations: 1
- Individual labs/activities: 0
- Group labs/activities: 1
- Other: 2, in-class/online activities and written debates/discussions/blogs.

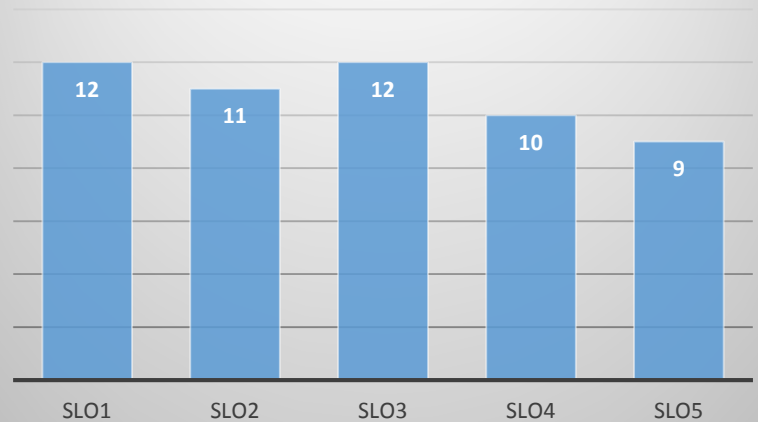
Percent of Students Achieving Exemplary or Competent on Each SLO



% of students at each level overall



Number of Classes Assessing Each Outcome



Student Learning Outcomes:

	SLO1	SLO2	SLO 3	SLO4	SLO5	% Exemplary	% Competent	% Developing	% Incomplete
N of classes assessing	12	11	12	10	9				
Mean % pass/average	83	85	80	88	74	39	44	12	6
St.Dev.	15	20	8	10	31	15	16	10	7

Changes/innovations to the class: One professor has already started to modify assignments to specifically address SLOs and states that this will be an ongoing process.

Ways in which learning was most evident:

- Students provide clear articulation of the ethics behind media and their own political views.
- Students were able to take turns leading and responding to discussions on various ethical topics.
- Students were able to correctly identify appropriate authors, theories, scientific ideas and/or legal concepts appropriate to the content and applying them to topics.
- Students were able to identify examples of discrimination and prejudice.

Unfortunately, many faculty chose to answer this question as “on which assessment was the learning evident” and answered “quizzes”, “discussions”, etc. or to provide a list of assignments provided.

Ways learning fell short: Most comments related to a lack of *deep or critical thinking* on the part of students:

- Inability to integrate material over the course of the semester.
- Lacked awareness of own ethical views or inability to empathize with another’s ethical views.
- Difficulty constructing logical arguments.
- Difficulty articulating positions they do not endorse.
- Students regurgitated facts accurately, but did not offer criticism, even to the point of accepting and repeating poor sources without critique.
- Difficulty with complex issues.
- Difficulty with providing personal insight.
- Tendency to rely on stereotypes and ignore within group variation.
- Difficulty in linking from class to real world experiences.
- Deep application of theories.

Finally, faculty noted that student answers were too brief to analyze or students opted out of participating because the question lacked a black and white answer.

Proposed changes: Many responses reflected changes to instruction. More examples/modeling of application of theory, in depth answers, or other class requirements. More questions aligned with the SLO would provide more opportunity for students to demonstrate proficiency. Provide more personal stories from people with different backgrounds to help students visualize different viewpoints. Improve the quality of questions/scenarios to force integration of ideas from across the semester and to students’ lives. Provide additional ethical questions/discussion. One proposed clarifying the reason for discussion – to expose multiple viewpoints rather than to reach an answer. “I don’t know” and citing constraints of the class such as class size instead of citing a change was a common answer.

Other notes: Qualifiers such as “to the extent that this SLO was assessed” indicate that although some SLOs were taught/assessed, they may not have been assessed at a level that allowed students to demonstrate the full range of competence. Additionally, in one case, faculty mentioned “identify ... when motivations ... very obvious or matched particular preconceptions” as evidence of when student learning was “most evident” which would not seem to indicate competence. Finally, some comments relating to grammar and mechanics may indicate an inability to separate the learning outcome from other criteria the professor may have had.

LASC AREA: 10, People and the Environment

YEAR: 2015-2016

Total Number of Reports: 13

Classes: ANTH 317, BIOL 346, CHEM 304, CM 327, ENG 407, GEOS 305, GEOS 330, GEOS 335, POL 345, PSY 324

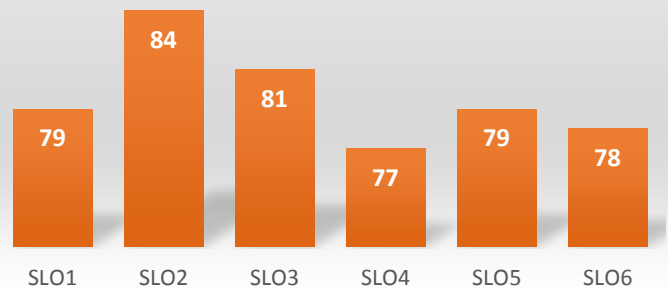
Delivery: Hybrid = 1, Face to Face = 5, Online = 7

Total Number of Students: 631

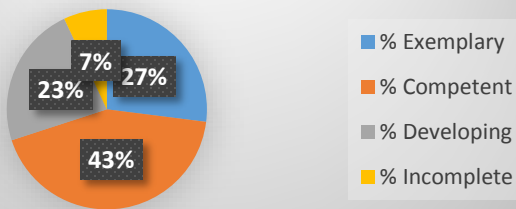
Basis of Assessment:

- Multiple Choice: 10
- Short Answer: 7
- Essay: 4
- Paper 1-5 pages: 8
- Paper 6-10 pages: 2
- Paper 11-15 pages: 0
- Individual Projects: 1
- Group Projects: 0
- Individual presentations: 2
- Group presentations: 2
- Individual labs/activities: 1
- Group labs/activities: 1
- Other: 2, in-class activities and written debates/discussions.

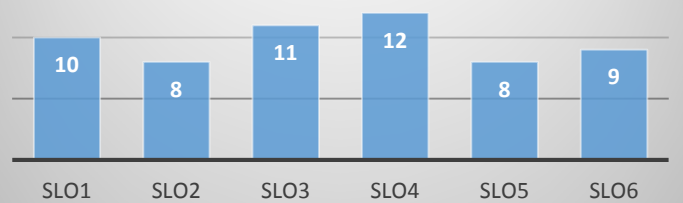
Percent of Students Achieving Exemplary or Competent on Each SLO



% of students at each level overall



Number of Classes Assessing Each Outcome



Student Learning Outcomes:

	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	%E	%C	%D	%I
N of classes assessing	10	8	11	12	8	9				
Mean % pass/average	79	84	81	77	79	78	27	43	23	7
St.Dev.	13	8	14	13	11	15	14	11	12	5

Changes/innovations to the class: Two instructors made substantial, intentional changes to the way LASC assessment was embedded into the course. Most others either made no changes or made only minor changes to the class where it was not evident that the change was in light of assessment data/student learning (for example, one made changes due to his/her own recovery from illness).

Ways in which learning was most evident: In one class, students demonstrated understanding of institutional arrangements for environmental policy from the local (Green Dragon) to national (Farm Bill, EPA) level. In another, most students demonstrated an application of appropriate mechanisms (carbon tax, subsidy) necessary to achieve change in their favored solution to an environmental problem. Multiple instructors mentioned an improvement in many student learning outcomes as the semester progressed. Unfortunately, many faculty chose to answer this question as “on which assessment was the learning evident” and answered “quizzes”, “discussions”, etc.

Ways learning fell short: These comments followed three general themes. First, higher order thinking skills were often not evident. Some examples of this include failure to differentiate between the concept of an official climate “adaption policy” by a government and the more generic idea of trying to adapt, the ability to appreciate nuances of a situation, and climate deniers unswayed by data. The second theme centered on constructing an evidence-based argument (whether written or oral) based on facts and logic. Examples in this category include Inability to construct an apples to apples comparison between alternative solutions, inability to recognize and defeat alternative proposals, lack of appropriate quantitative reasoning, and lack of citation. The final theme involved a general ignorance of the world combined with a lack of preparation. Specifically mentioned were an overall profound ignorance of environmental issues and of politics upon entering course. Student failure to read material and otherwise prepare for class was listed as was the fact that non-major students in the [biology] class might need more background in ecology than was originally planned by the instructor. Finally, a provincial world view, illustrated by an inability by international students to comprehend American environmental policy in terms of American culture, and vice versa, was also discussed.

Proposed changes: There were a few proposed curricular innovations mentioned.

- Using a rubric for papers and giving this to the students ahead of time (which worked for the second paper in this class).
- Specifically teaching students how to engage in *scientific* argumentation/oral presentation as opposed to relying on political dogma/rhetoric.
- Scaffold interactions between American and International students to reduce the amount of provincialism.
- Peer skepticism is useful in forcing a student to broaden their consideration of a topic.

Unfortunately, a few faculty just listed needs, but did not have innovations in mind, such as need for better examples, and need for improved ways of making connections across the science and societal interactions of environmental concerns.

Other notes: One class only reported assessment for SLO1 and SLO2 and based on this information should have its LASC10 designation removed.