# Assessment Report
# on
# Academic Programs and General Education
# at the
# University of Minnesota, Morris

Data from Academic Year 2012-13

Report compiled by 2013-14 Assessment of Student Learning Committee

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## Description of Assessment Activity

The following request was sent to academic programs in April 2012:

*The Assessment of Student Learning Committee will be authoring a report on General Education for the Higher Learning Commission. To help us in this daunting endeavor, we need disciplines to look at General Education within their respective disciplines. We are in the process of examining and documenting how General Education has been assessed in disciplines across campus. Some disciplines have assessed it, and others have not. Because we will need data on the assessment of General Education for this report (not just discipline plans to do so), we humbly request the following:*

*For your respective disciplines' next assessment reports, we would like to request that disciplines look specifically at the General Education Requirements within their specific programs.*

*We request that each discipline*

*(1) focus on at least one (1) General Education requirement that is the most prevalent in their discipline;*

*(2) come up with one or two (1-2) objectives within that General Education Requirement;*

*(3) create a direct assessment measure* (such as a quiz or essay they currently use with some adjustment);*

*(4) assess the students;*

*(5) and report the results (changes or no changes as a result of the assessment).*

**Just to refresh your memories, some examples of direct measures include (but are not limited to) the following:*

- *projects;*
- *performances;*
- *portfolios;*
- *capstone experiences and/or projects;*
- *licensure and pre-professional examinations;*
- *papers;*
- *exams;*
- *standardized exams;*
- *presentations;*
- *internships;*
- *field experiences.*

*If you have any questions, please do not hesitate to contact me. Thank you.*

**Summary of Assessment Reports Collected from Academic Programs**
Fall 2013

| | Assessment report turned in? | GenEd Assessment completed? | GenEd category that was assessed |
|---|---|---|---|
| **EDUCATION** | | | |
| Elementary Education | Yes | Yes | HDiv |
| Secondary Education | Yes | Yes | HDiv |
| Sport Management | No | -- | -- |
| | | | |
| **HUMANITIES** | | | |
| Art History | Yes | Yes | FA |
| Art, Studio | Yes | Yes | ArtP |
| CMR | Yes | Yes | E/CR |
| English | Yes | No | -- |
| French | Yes | Yes | FL |
| German Studies | Yes | Yes | FL |
| Music | Yes | No | -- |
| Philosophy | Yes | Yes | M/SR, HUM |
| Spanish | Yes | Yes | FL |
| Theatre Arts | Yes | No | -- |
| | | | |
| | | | |
| **SCIENCE and MATHEMATICS** | | | |
| Biology | Yes | No | -- |
| Chemistry | Yes | Yes | Sci-L |
| Computer Science | Yes | No | -- |
| Geology | No | -- | -- |
| Mathematics | Yes | Yes | M/SR |
| Physics | Yes | Yes | Sci-L |
| Statistics | Yes | Yes | M/SR |
| | | | |
| | | | |
| **SOCIAL SCIENCE** | | | |
| Anthropology | No | -- | -- |
| Economics | No | -- | -- |
| History | No | -- | -- |
| Liberal Arts for the Human Services | No | -- | -- |
| Management | No | -- | -- |
| Political Science | No | -- | -- |
| Psychology | No | -- | -- |
| Sociology | No | -- | -- |
| Gender, Women, & Sexuality Studies | Yes | Yes | HDiv |
| | | | |
| | | | |

## Elementary and Secondary Education Assessment

### Contributions to General Education

The following courses are limited only to students in the elementary or secondary program. Course assessments directly link to the general education requirements and include performance evaluation, reflective papers, and examinations.

- *Human Diversity (HDIV)*
  ElEd 4201 Directed Student Teaching in Primary and Intermediate Grades
  SeEd 4104 Teaching Diverse Learners
  SeEd 4201Directed Student Teaching in the Middle and Secondary School

- *International Perspective (IP)*
  ElEd 4204 Directed Student Teaching in International School at the Primary and Intermediate Level
  SeEd 4204 Directed Student Teaching in International School at the Middle and Secondary Level

### Assessment of General Education Requirement

a. The most prevalent general education in the teacher education disciplines is Human Diversity (HDIV).

b. For the purpose of this assessment, we focused on two of the ten standards of effective practice (See https://www.revisor.mn.gov/rules/?id=8710.2000): Student Learning and Diverse Learners. Specifically, the objective was that 2013 student teaching summative evaluation scores in the categories of *student learning* and *diverse learners* (as assessed by cooperating teachers and University supervisors) would be higher than scores for 2012 student teaching evaluations. Our cohort size is small, and we know to interpret cautiously any differences between cohorts. Still, with the full implementation of the edTPA, it is important to look for data that might judge its impact on our candidates.

c. Assessment

| | | CT Scores | | Univ Sup Scores | |
|---|---|---|---|---|---|
| **2012** | N | St Lrng | Div Lrnrs | St Lrng | Div Lrnrs |
| ElEd | 26 | 2.23 (.65) | 2.15 (.61) | 2.12 (.60) | 2.28 (.74) |
| Se Ed | 10 | 2.35 (.41) | 2.15 (.53) | 2.3 (.67) | 1.78 (.67) |
| Unit | 36 | 2.29 | 2.15 | 2.21 | 2.03 |

| | | CT Scores | | Univ Sup Scores | |
|---|---|---|---|---|---|
| **2013** | N | St Lrng | Div Lrnrs | St Lrng | Div Lrnrs |
| ElEd | 16 | 2.59 (.46) | 2.59 (.46) | 2.53 (.59) | 2.41 (.46) |
| Se Ed | 9 | 2.44 (.53) | 2.22 (.44) | 2.11 (.33) | 2.11 (.33) |
| Unit | 25 | 2.54 (.48) | 2.46(.48) | 2.38 (.55) | 2.30 (.43) |

d. Average scores for the 2013 cohort were higher than those of the 2012 graduates in all but one case. University supervisors rated 2013 graduates lower in the area of student learning than they did 2012 graduates.

## Art History Assessment

**Assessment Plan**

Per the request of the UMM Assessment of Student Learning Committee, ArtH undertook assessment of one of our discipline objectives that relates to the Fine Arts Gen Ed requirement. Our assessment was limited to one large introductory course as 1) we were assessing our discipline extensively by means of the RAR and Program Review reports due this particular year; and 2) one of our regular faculty members, Jimmy Schryver, was on sabbatical, and we did not want to ask a temporary faculty member to take on an additional burden.

For our assessment, Julia Dabbs implemented a pre-test/post-test in ArtH 1101 (Principles of Art), spring semester, to gauge students' comprehension and application of formal analysis vocabulary, as well as their ability to develop an original interpretation derived from that analysis, in keeping with objective 2 (below) of our discipline objectives.

**Assessment Results,** Dabbs, ArtH 1101 Principles of Art, Spring 2013:

This assessment involved a pre- and post-testing of the appropriate use of art terminology when writing a comparison essay on two works of art (Matisse's Red Room and Vermeer's Young Woman with a Water Pitcher). Having students gain a more sophisticated and nuanced vocabulary by which to analyze and discuss a work of art's form and appearance (i.e. formal analysis) is a fundamental goal of this particular course and relevant to one of our Art History discipline objectives: "To teach students methods of analysis and interpretation of works of art." And in regards to UMM Student Learning Outcomes, this assessment relates to the development of the intellectual and practical skills of "inquiry and analysis," "critical thinking and problem-solving," and "written communication."

Students were asked to compare the same 2 works of art, given the same amount of time (approximately 20 minutes), and based on the same categories of visual analysis (composition, color, light/shade, illusion of depth, and line). The pre-test occurred before we had the instructional unit on formal analysis; the post-test occurred during the unit exam. I did not discuss these particular works of art in class, so students needed to independently apply what they had learned. I then scored a random sample of 23 out of 48 essays.

Although the pre-test writing was not evaluated as part of their course grade, students took the in-class exercise quite seriously and most students wrote over a page for their response. Most, however, focused on the subject matter and their response to it, with little supporting visual analysis evidence. On the pre-test, students incorporated an average of 1.08 art terms in their descriptive analysis; whereas following the instructional unit on formal analysis, they averaged 11.4 art terms in their essays. These results are comparable to findings from 2010-11 when I conducted a similar assessment (1.63 pre-test terms/10.3 post-test). This year, the highest number of terms used by a student in the pre-test was 5; the highest number in the post-test was 18. Their overall essay scores naturally also reflected improvement (average 24.6 pre-test to 27 pts. post-test), as students were now able to more deeply and persuasively form a comparative analysis.

## Art, Studio Assessment

**Learning Objectives for Majors:**
1. Students will be introduced to the technical skills necessary to activities in the visual arts; this includes materials, techniques, the safe use of tools, and the safe disposal of waste.

2. Students will be introduced to the concepts necessary to activities in the visual arts; this includes the formal elements of art, as well as learning to think independently, understanding the historical and contemporary development of art and their place in it, the relationship of art to self, culture, and society, and to question and examine everything with a critical eye.

3. Students will be introduced to verbal / communication skills necessary to activities in the visual arts; this includes the ability to talk clearly and thoughtfully about their own art as well as the art of others.

4. Students will be introduced to the major traditions of art and the place of visual arts in our culture.

**Direct Measures:**
Assessment Questions: Four questions within the Portfolio Review form specifically address assessment of the discipline within the 4 learning objectives for the major listed above (see data below). Data were gathered twice last year – fall semester during Senior Portfolio Review and again in the spring during the Second Year Portfolio Review. Faculty members were asked to assess the discipline's success in the four areas as demonstrated by the student's work being reviewed. Studio Art and Art History faculty were asked to what extent the student, and / or artwork, demonstrates the fulfillment of each objective. Data were reported and reviewed by the discipline for action during the spring assessment meeting.

Second Year and Senior Portfolio Reviews: Student artwork was evaluated by the Studio Art and Art History faculty first during the spring semester for second year students, and then again in the fall semester for graduating seniors. Students presented their artwork and a written artist statement to the faculty committee -- discussing the process for creating the work, their formal and aesthetic considerations as well as conceptual interests.

Following the review session, participating faculty each completed a form rating the student's performance on a scale from 1 to 10 in the following areas:

A. Formal Concerns:
- Student demonstrates an understanding of the elements of art and the principles of design.
- Student's drawings represent a level of skill appropriate to the student's experience.

B. Technical Concerns:
- Student can identify / describe the materials and technical processes involved in creating their work.
- Student is completing the quantity of work expected for their level of experience.

- Student is completing work at the quality expected for their level of technical experience.
- Student demonstrates an understanding of the importance of presentation & craftsmanship. This should include at least 3 pieces of their choice (representing more than one media), completed to a level of finish and refinement expected for the student's level of experience.

C. Conceptual & Communication Skills:

- Student is able to discuss the conceptual basis of their work and communicate the ideas that they are exploring.
- Student demonstrates an understanding of how their work relates to a broader context and is able to articulate the relationship, referring to cultural, and art historical and / or personal influences.
- Evaluate student's written statement. Artist's statement describes the formal, technical and conceptual foundations of the student's work.

These measures assessed the learning objectives 1 – 4 listed above.

**Assessment Meetings:**
Jess Larson, Michael Eble and Kevin Flicker met the first week May during exam week to assess the series of Ceramic classes that the Studio Art program offers throughout the year.

Kevin Flicker – teaching specialist Ceramics presented syllabi and slideshow of images of recent student work and firings.

ARTS 1050 **- Beginning Ceramics (ART/P)**
(3.0 cr [max 6.0 cr]; fall, every year)
Personal expression through the medium of clay. Topics include forming methods using stoneware and porcelain (hand building and wheel techniques), glazing, the nature of clay, glaze chemistry, firing, and kilns.

- His beginning classes explore personal expression through the medium of clay
- Students use historical and contemporary hand buidling techniques to create vessel-based ceramics that are ideally both functional and aesthetically pleasing.
- Glazing, Firing, and clay composition is also covered. This class continues to be one of the most popular and competitive classes to enroll in at UMM.
- We encourage Kevin to continue approach this class in the same methods.

ARTS 3650 **- Advanced Ceramics (ART/P)**
(3.0 cr [max 9.0 cr]; Prereq-1050 or #; fall, spring, offered periodically)
For students who have a working knowledge of basic forming and glazing techniques. Emphasis on advanced hand building and wheel techniques, critiques, glaze experiments, and firing. Assigned projects for the course may vary from semester to semester.

- The focus of this class is on surface decoration on earthenware, stoneware, and porcelain.

- A variety of techniques to impart texture on the clay surface is emphasized, including fluting, paddling, slipware, carving, stamping. Sprigging. Cogging, combing, rouletting, and templating.
- This class often struggles to fill at times; we have encouraged Kevin to recruit students more and to fold directed studies into the advance class. Reinsuring strong numbers each semester.
- We would like to ensure the class continues as a signifigant role in the studio art program and as a major medium of student for majors within the Studio Art program.

ARTS 3012 **- Media Studies: Ceramics (ART/P)**
(3.0 cr [max 9.0 cr]; Prereq-major or minor in ArtS; fall, spring, offered periodically)
Study of and practice in specialized methods and techniques in ceramics not covered under the regular curriculum.

- The Tile making class recently transitioned into a Media Studies class in Ceramics
- This will provide Kevin an opportunity and flexibility to teach a class that may offer other processes or techniques that have not been covered in the past.
- The tile-making class explores the rich history of functional and decorative ceramic tile, including mosaics.
- Students design and build both flat and three-dimensional tiles, which after firing are used to construct tabletops, wall mural, and sculptural pieces.

Additionally we discussed the importance of the yearly wood firing within the Ceramics program. Kevin often struggles with varying degrees of interest within the firing process. We encouraged Kevin to layout the importance of being involved with this firing process in the class syllabus, so students are aware of this important component to the class.

Through discussion the following adjustments were proposed:

- Enrollment priorities should be given to studio art majors who need to complete a Ceramics course for graduation or for secondary education licensure. This also will help foster Ceramics as a major medium within the Studio Art discipline.
- An importance of fostering the Advance Ceramic course that will fill much more consistently.
- Students interested in working in directed or independent studies in Ceramics should be advised to enroll in the Advance Ceramic classes.
- Wood-Firing requirements should be laid out in the initial syllabus of the semester.
- We also would like Kevin to emphasize ceramics as a sculptural medium in beginning classes and advance classes. Allowing to understand the medium that sculptural work can be made along with pottery and functional vessel

The Studio art discipline commends Kevin Flicker and the ceramic work produced by his students over the last 15+ plus years at UMM. The Ceramics program has continued to grow and produce quality students on several different levels.

Assessment Data Summary, Studio Art

Item 1: Introduce students to the technical skills necessary to activities in the visual arts; this includes materials, techniques, the safe use of tools (for example, everything from paint brushes, potters tools, wheels, and kilns, carpentry tools, power tools, to printmaking presses and equipment), the safe disposal of waste.

Item 2: Introduce students to the concepts necessary to activities in the visual arts; this includes the formal elements of art, as well as, learning to think independently, understanding the historical and contemporary development of art and their place in it, the relationship of art to self, culture, and society, and to question and examine everything with a critical eye.

Item 3: Introduce students to verbal/communication skills necessary to activities in the visual arts; this includes the ability to talk clearly and thoughtfully about their own art as well as the art of others.

Item 4: Introduce students to the major traditions of art and the place of visual arts in our culture.

Assessment Data Summary, Studio Art

| | Item 1 | Item 2 | Item 3 | Item 4 |
|---|---|---|---|---|
| 2nd Year Reviews Spring 2012 | | | | |
| Student #1 | 7.0 | 7.7 | 7.0 | 7.7 |
| Student #2 | 7.3 | 6.3 | 5.7 | 6.7 |
| Student #3 | 8.7 | 9.7 | 10.0 | 9.3 |
| Student #4 | 7.7 | 7.9 | 7.6 | 7.9 |
| Student #5 | 9.0 | 7.7 | 8.7 | 8.0 |
| Student #6 | 7.7 | 8.7 | 9.3 | 8.7 |
| Student #7 | 7.7 | 7.3 | 6.7 | 7.3 |
| Student #8 | 8.3 | 7.7 | 9.7 | 6.7 |
| Student #9 | 9.0 | 10.0 | 9.7 | 9.7 |
| Student #10 | 9.0 | 9.0 | 9.3 | 9.0 |
| Student #11 | 8.0 | 8.0 | 8.0 | 7.5 |
| Average | 8.1 | 8.2 | 8.3 | 8.0 |
| | | | | |
| | | | | |
| Senior Reviews Fall 2011 | | | | |
| | 9.3 | 9.0 | 9.3 | 9.3 |
| | 9.0 | 8.3 | 8.0 | 8.5 |
| | 9.3 | 9.5 | 9.0 | 9.3 |
| | 8.6 | 7.8 | 7.2 | 7.0 |
| | 8.0 | 7.6 | 8.6 | 7.3 |
| | 8.4 | 8.6 | 9.0 | 8.6 |
| | 8.0 | 7.8 | 7.6 | 5.8 |
| | 8.8 | 8.8 | 8.3 | 7.8 |
| | 5.8 | 4.8 | 4.8 | 4.8 |
| | 9.2 | 9.2 | 9.2 | 9.2 |
| | 8.5 | 8.0 | 8.8 | 7.5 |
| | 9.2 | 9.4 | 9.2 | 8.6 |
| | 9.0 | 8.3 | 8.3 | 8.3 |
| | 8.6 | 9.8 | 10.0 | 9.8 |
| 14 Graduating Seniors | 8.5 | 8.3 | 8.4 | 8.0 |

**Communication, Media and Rhetoric Assessment**

The CMR 1052 class has an E/Cr designation, which states, the Gen Ed "Ethical and Civic Responsibility" is designed: "To broaden and develop students' capacity to question and reflect upon their own and society's values and critical responsibilities, and to understand forces, such as technology, that cause them to modify these views and often mandate creation of new ways to resolve legal, social and scientific issues."

During school year 2012-13 there were 15 sections of CMR 1052. Professor Burke did this assessment within her 7 sections of CMR 1052, Introduction to Public Speaking. A total of 130/ 137 students responded to the assessment request.

Although the half-term course only met 15 times, a portion of a class at the end of the course was deliberately set aside to review, clarify, discuss and evaluate the ways the given course fit within the Liberal Arts, and met the spirit of the GenEd requirement.

During the discussions several themes became apparent--before the lesson: a) a small but noticeable number of (mostly first-year) students were unaware of the Liberal Arts mission and/or what that may mean at UMM; b) some students questioned why particular elements are mandated for all educated students and other elements of the GenEds are "pick 2 from this list of 4"; and c) several students questioned why Public Speaking does not either fit within "skills" (rather than "Liberal learning"); and/or d) why it does not have a designator like CW/WLA "all to itself."

At the end of the lesson, after the discussion, students completed a three-question, qualitative assessment survey. The first question asked for a description of the students' understanding of the Gen Ed goals. The second question asked for students to say why "this was considered important for students in the Liberal Arts." The third question asked "In what ways do you think CMR 1052 connects to the GenEd?"

Written responses from students indicate that almost all of them believe they accurately received and understood the message of the lesson, and believe that they left the course with a stronger understanding of the connections they were asked to make. Although they vary in writing quality, the majority responded with comments such as:

- to get students to think ethically & critically
- to give a well-rounded education
- to create active citizens/ to better society
- to develop critical thinking
- to evaluate, critic (sic) and refute persuasive ideas
- to better prepare us for what comes after college
- to foster civil society
- to broaden our education to the fullest
- because we are not only supposed to be a excellent person in our own major, but also should learn something for Liberal Arts.

In summary, the qualitative findings from this survey indicate that, to a great extent, CMR has documentation that the Introduction to Public Speaking students have significant awareness and understanding of how we have designed and taught CMR 1052 to meet this GenEd graduation requirement. This data reinforces the findings from previous years' assessment by CMR for this course—with consistently high-levels of responses, and strong indications that students are able to articulate the connections.

Because we have no comparative data with other E/Cr classes we cannot extend analysis to understand what our findings mean in relation to other E/Cr classes. Furthermore, we can not discuss how students select or use the "2 of 4" classes they complete within this Liberal Arts/ "Liberal learning" category, and can not otherwise interpret how this E/Cr interchanges with the student accomplishments within the assortment of GenEds (E/Cr, HDiv, IP, Envt) that comprise the category of "The Global Village".

Lastly, it appears it would serve the institution well to have greater instruction in the Liberal Arts mission of UMM, perhaps as part of the orientation process for all students.

**French Assessment**

Assessment Plan 12/13: The French Discipline focused on assessing the FL general education courses in 2012-2013.

Our goal: According to UMM's 2011-2013 catalog, the Foreign Language general education requirement has as its goal "to develop some fluency in the skills of speaking, listening, reading, and writing in a second language; and critical insight into another culture."

Method of assessment:

- Three of the four skills mentioned in the description of the FL gen ed will be assessed with the aid of the WebCape placement test, recently adopted by UMM.
    - For each section of Fren 1001, the WebCape placement test will be administered at the beginning of the semester to establish proficiency level at the beginning of the two-semester sequence. This test assesses reading, grammar, and listening comprehension skills.
    - The same test will be administered at the conclusion of Fren 1002, and beginning and end-of-year scores for individual students will be compared in order to measure their progress. In addition, average scores for the classes will be calculated to assess a general level of achievement and progress.
- The fourth skill mentioned in the description of the FL gen ed, writing skills, will be assessed via a comparison of the students' first essay in Fren 1001 and their last one in Fren 1002[1].
- Finally, cultural knowledge will be assessed via a pre- and post-test in Fren 1002[2].

Assessment:

- The WebCape test was given to students prior to their arrival at UMM. These scores are indicated as their pre-1001 tests.
- The same test was administered to this group of students in December 2012, at the end of Fren 1001. These scores are indicated as their post-1001 tests.
- Finally, the WebCape test was administered at the end of Fren 1002, in May 2013. These scores are indicated as their post-1002 tests. (The test is always new to the individual student, questions are randomized and progressively more difficult: each correct answer leads to a more advanced question).

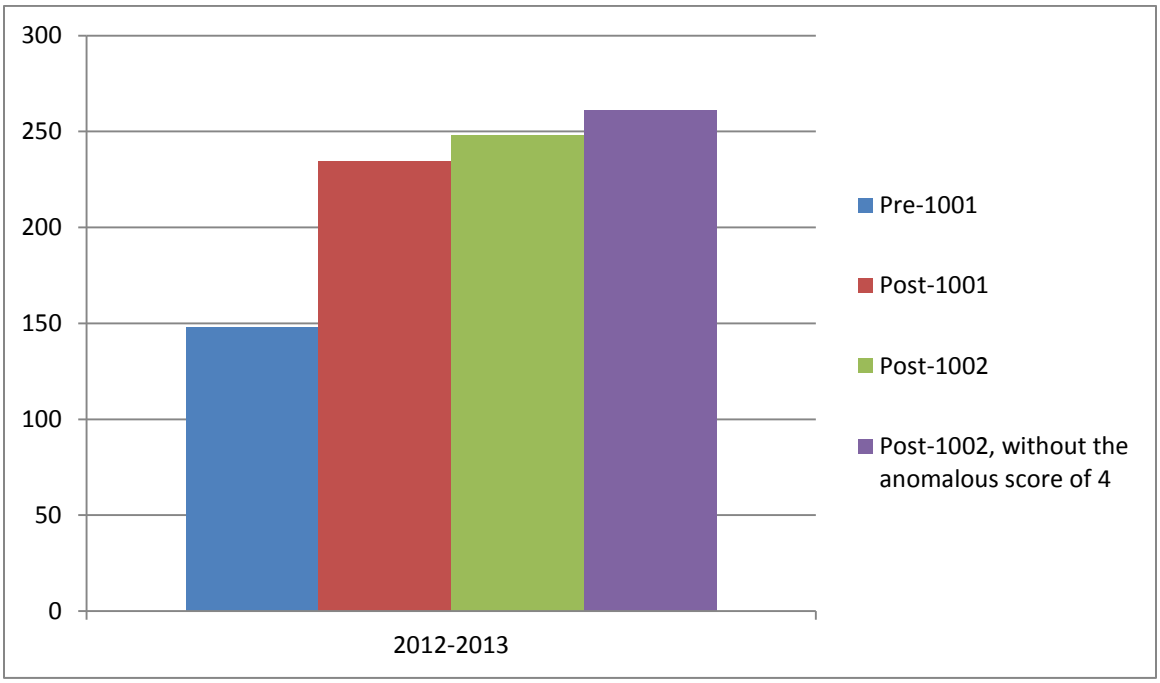
Results: Although the average scores reflect improvement across the year in our students' understanding and use of the French language, there were several anomalous scores: students' scores **dropped** significantly after a semester's worth of study. Several students did not take the post test, opting instead for an hour of extra study time before the final

[1] This assessment was not carried out, although the Web Cape proficiency exam does contain reading comprehension questions.
[2] This assessment was not carried out.

exam for the course. In the future, (for the purposes of assessment) the placement test will count as a small part of the students' final exam grade for the course.

The scores across the three instances of the exam were as follows:

- The average score pre-1001 was 147.74.
- The average score post-1001 was 234.30
- The average score post-1002 was 248.08
    - There was one student whose score was a 4 on the post-1002 test. This score is anomalous, especially given that the student in question scored a 95% on the cumulative final exam in Fren 1002. Without that score, the post-1002 average score is 261.27.




These results indicate that our Fren 1001-1002 courses are doing what they are designed to do, that is, increase our students' ability to understand and use the French language.

On an individual level, most students demonstrate gain in understanding the French language, with several showing a marked increase (i.e. student #40 went from 0 to 405, a score suggesting s/he could theoretically skip 2001), and an average gain of nearly 88 points on the placement tests.

Eight students' scores went down at the end of the semester. It is difficult to assess why that is, without a stronger control sample.

The post-1002 placement tests scores also show a general increase in knowledge, with an average increase in score of over 20 points. It is to be noted, however, that of the 23 test scores, 12 of them scored lower on the post-1002 test than they had on the post-1001 test. It is likely that this decrease in score is not a reflection of their actual learning, but of the students' choosing not taking the WebCape test seriously. Other scores are missing because the students chose not take the test at all.

Despite mishaps that skewed our scores towards the low end, the average scores over the Fren1001-1002 sequence improved from 147.74 to 261.27, a statistically significant improvement of 113.53 points. Furthermore, the average score on the written final exam for Fren 1002, across both sections, was 73%, indicating that most students synthesized a significant amount of course material and achieved basic proficiency. These scores suggest that students are prepared for the intermediate level and that Fren 1001-1002 series is accomplishing its goals of facilitating our students' progress towards some fluency in French.

**German Studies Assessment**

Per the request of the UMM Assessment of Student Learning Committee, German undertook the assessment of one of our discipline objectives that relates to the Language Gen Ed requirement.

The assessment was limited to one large introductory. As a new faculty member and the sole member of the core of the German Studies Discipline, I began last year by assessing the effectiveness of beginning language instruction and the retention rate from first to second semester as they relate to the goals of the Foreign Language general education requirement "to develop some fluency in the skills of speaking, listening, reading, and writing in a second language; and critical insight into another culture."

For my assessment, I used this year's students to establish a baseline for German language instruction against which subsequent years may be evaluated. As the program is also undergoing a massive re-organization to reflect the new German Studies Major, a good portion of the coming year will be consumed by re-writing the German Studies curriculum, so that future course offerings reflect the reorganization which includes new courses in English and the offerings in German. Due to this reorganization, the method of assessment will remain the same for the 2013-2014 academic year.

<u>Method of assessment</u>:

- Three of the four skills mentioned in the description of the FL ged ed will be assessed with the aid of the WebCape placement test, recently adopted by UMM.
    - For each section of GER 1001, the WebCape placement test will be administered at the beginning of the semester to establish proficiency level at the beginning of the two-semester sequence. This test assesses reading, grammar, and listening comprehension skills.
    - The same test will be administered at the conclusion of GER1002, and beginning and end-of-year scores for individual students will be compared in order to measure their progress. In addition, average scores for the classes will be calculated to assess a general level of achievement and progress.
- The fourth skill mentioned in the description of the FL gen ed, writing skills, will be assessed via a comparison of the students' first essay in GER1001 and their last one in GER1002.
- Finally, cultural knowledge will be assessed via a pre- and post-test in GER1002.

Results of 2012-2013 assessment:

- Three of the four skills mentioned in the description of the FL ged ed will be assessed with the aid of the WebCape placement test, recently adopted by UMM.

    - Students, as expected showed improvement when comparing Webcape tests from Fall 2012 to those of Spring 2013 in the areas of reading, grammar, and listening comprehension skills.

    - As this was only the first year, ongoing test will continue to generate a year to year assessment model.

- Students exhibited marked improvement in both writing and cultural knowledge
- Finally, in terms of retention, German retained the same number of students from Fall 2012 to Spring 2013 and saw student numbers from 51 in the Fall of 2012 to 84 in the Fall of 2013 – that's a 64% increase only in the course of one year.

## Philosophy Assessment

This year, we have used new assessment tools to look at student learning concerning learning goals (1) and (7) to assess the success of our Introduction to Symbolic Logic course. This course meets the general education M/SR requirement. The questionnaire and results from two sections of this course are included below. The first section of the questionnaire is designed to assess student comprehension and performance of a broad range of logical concepts and abilities.

**I. Assessment Tool for Introduction to Symbolic Logic:**

**For each question, choose the number that best fits your abilities, using the following scale: 1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree.**

1. Are you able to identify premises and conclusions in a wide variety of arguments?
2. Are you able to list a range of argument types that have unique methods of evaluation?
3. Are you able to analyze the structure of and evaluate analogies?
4. Are you able to identify a wide range of formal and informal fallacies?
5. Are you able to analyze the structure of and evaluate deductive arguments dealing with classes such as 'All members of one class are members of another"?
6. Are you able to analyze the structure of and evaluate deductive arguments dealing with compound propositional statements using conditionals, disjunctions, and conjunctions?
7. Are you able to analyze the structure of and evaluate deductive arguments dealing with sentences that contain existential or universal generalizations?
8. Are you able to analyze the structure of and evaluate inductive causal inferences?
9. Are you able to analyze the structure of and evaluate statistical reasoning?
10. Are you able to analyze the structure of and evaluate probabilities?

I had a student run a statistical analysis on the results. The raw data from 41 students was recorded in the attached appendix 1 and the resulting analyses are attached in appendix 2. I have had to learn how to interpret much of this data and have not been able to profit from all of it, but I have drawn two conclusions. One, from the Paired Sample Statistics table, all questions showed positive results in student comprehension over the course of the semester, the difference in the pre and post mean scores ranged from +0.3 to +1.6. This appears to be good news, but it is tempered by the second finding. Two, from the Paired Samples Correlations table, it appears that questions 1, 9, and 10 did not show a statistically significant difference. This is a result of the value in the last column of that table being equal to or less 0.5. I am not surprised that this occurred on question 9, because we did not cover this material in this course! I am only slightly surprised that this occurred on question 10, because this was the first time I had covered this material in a course. Furthermore, I am greatly surprised that this occurred on question 1, because this question was designed to be a general question that that covers a student's most general skills in analyzing any argument.

**Changes Based on Assessment.**

Unfortunately, the data for the Introduction to Symbolic Logic course has limited value because the instructor has changed the textbook that is used in the course. However, the lower scores on questions will give the instructor reason to reflect on the pedagogy used in those sections and some of the surprising results may lead to changes in the wording of future assessment questions.

**These are the statistics generated from the above raw data. Interpretive instructions are also included below.**

## Descriptives

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| 1 – pre | 41 | 1.00 | 5.00 | 2.5500 | .89303 |
| 1 – post | 35 | 1.0 | 3.0 | 1.640 | .6376 |
| 2 – pre | 41 | 2.0000 | 5.0000 | 3.312500 | .8565009 |
| 2 – post | 35 | 1.000 | 4.000 | 2.25500 | .742210 |
| 3 – pre | 41 | 1.0000 | 5.0000 | 2.687500 | .8992184 |
| 3 – post | 35 | 1.0 | 4.0 | 1.874 | .7196 |
| 4 – pre | 40 | 1.0000 | 5.0000 | 3.344063 | 1.0325938 |
| 4 – post | 35 | 1.000 | 4.000 | 1.78643 | .797592 |
| 5 – pre | 41 | 1.000 | 5.000 | 2.77500 | .879986 |
| 5 – post | 35 | 1.000 | 3.000 | 1.90357 | .703252 |
| 6 – pre | 41 | 1.00 | 5.00 | 3.6500 | .93675 |
| 6 – post | 34 | 1.000 | 4.000 | 1.95956 | .836389 |
| 7 – pre | 41 | 1.000 | 5.000 | 3.22500 | 1.012114 |
| 7 – post | 35 | 1.00 | 5.00 | 2.2843 | 1.07339 |
| 8 – pre | 40 | 2.0000 | 5.0000 | 3.600313 | .9620711 |
| 8 – post | 33 | 1.000 | 5.000 | 2.57803 | 1.030469 |
| 9 – pre | 41 | 1.0000 | 5.0000 | 3.187500 | 1.0349366 |
| 9 – post | 34 | 1.000 | 5.000 | 2.38162 | 1.155345 |
| 10 – pre | 40 | 1.00 | 5.00 | 2.9212 | .99710 |
| 10 – post | 35 | 1.00 | 5.00 | 2.5186 | 1.09290 |
| Valid N (listwise) | 30 | | | | |

## T-Test

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | 1 – pre | 2.5014 | 35 | .91559 | .15476 |
| | 1 – post | 1.640 | 35 | .6376 | .1078 |
| Pair 2 | 2 – pre | 3.280357 | 35 | .8330781 | .1408159 |
| | 2 – post | 2.25500 | 35 | .742210 | .125456 |
| Pair 3 | 3 – pre | 2.605357 | 35 | .9058089 | .1531096 |
| | 3 – post | 1.874 | 35 | .7196 | .1216 |
| Pair 4 | 4 – pre | 3.316544 | 34 | 1.0431900 | .1789056 |
| | 4 – post | 1.80956 | 34 | .797582 | .136784 |
| Pair 5 | 5 – pre | 2.85071 | 35 | .911860 | .154132 |
| | 5 – post | 1.90357 | 35 | .703252 | .118871 |
| Pair 6 | 6 – pre | 3.5485 | 34 | .92429 | .15851 |
| | 6 – post | 1.95956 | 34 | .836389 | .143439 |
| Pair 7 | 7 – pre | 3.14929 | 35 | 1.003972 | .169702 |
| | 7 – post | 2.2843 | 35 | 1.07339 | .18144 |
| Pair 8 | 8 – pre | 3.562891 | 32 | .9223670 | .1630530 |
| | 8 – post | 2.59609 | 32 | 1.041635 | .184137 |
| Pair 9 | 9 – pre | 3.196691 | 34 | 1.0145873 | .1740003 |
| | 9 – post | 2.38162 | 34 | 1.155345 | .198140 |
| Pair 10 | 10 – pre | 2.8485 | 34 | .95731 | .16418 |
| | 10 – post | 2.5044 | 34 | 1.10607 | .18969 |

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | 1 – pre & 1 – post | 35 | .352 | .038 |
| Pair 2 | 2 – pre & 2 – post | 35 | .332 | .052 |
| Pair 3 | 3 – pre & 3 – post | 35 | .018 | .920 |
| Pair 4 | 4 – pre & 4 – post | 34 | .325 | .061 |
| Pair 5 | 5 – pre & 5 – post | 35 | .027 | .879 |
| Pair 6 | 6 – pre & 6 – post | 34 | -.137 | .440 |
| Pair 7 | 7 – pre & 7 – post | 35 | .014 | .938 |
| Pair 8 | 8 – pre & 8 – post | 32 | .262 | .148 |
| Pair 9 | 9 – pre & 9 – post | 34 | .541 | .001 |
| Pair 10 | 10 – pre & 10 – post | 34 | .446 | .008 |

**Paired Samples Statistics**

| | | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | Number of Older Siblings | 1.24 | 45 | 1.264 | .188 |
| | Number of Younger Siblings | 1.13 | 45 | 1.198 | .179 |

This gives the descriptive statistics for each of the two groups (as defined by the pair of variables.) In this example, there are 45 people who responded to the Older siblings question (N), and they have, on average, 1.24 older siblings, with a standard deviation of 1.26 older siblings. These same 45 people also responded to the Younger siblings question (N), and they have, on average, 1.13 younger siblings, with a standard deviation of 1.20 younger siblings. The last column gives the standard error of the mean for each of the two variables.

The second part of the output gives the correlation between the pair of variables:

**Paired Samples Correlations**

| | | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | Number of Older Siblings & Number of Younger Siblings | 45 | -.292 | .052 |

This again shows that there are 45 pairs of observations (N). The correlation between the two variables is given in the third column. In this example r = -.292. The last column give the p value for the correlation coefficient. As always, if the p value is less than or equal to the alpha level, then you can reject the null hypothesis that the population correlation coefficient (ρ) is equal to 0. In this case, p = .052, so we fail to reject the null hypothesis. That is, there is insufficient evidence to conclude that the population correlation (ρ) is different from 0.

FROM http://academic.udayton.edu/gregelvers/psy216/spss/ttests.htm

## Spanish Assessment

**ASSESSMENT PLAN**

Most incoming students who take the Placement Test for Spanish place into the second semester of Beginning Spanish II (1002). Rather than require that these students wait until the spring semester to enroll in this class, we offer several trailer sections in the fall semester. However, a number of students (generally 40-50 in a given year) do wait until the spring semester to take this course. This course has historically presented a number of problems both for students and for faculty.

- Students are required to purchase a textbook and workbook that they use for only one semester, not two as it is designed for (and priced accordingly).

- Students who wait to take the course until the spring semester are placed with other students who took Beginning Spanish I in the fall and whose skills are "fresher." We've been concerned that it seems unfair to expect the students who tested out of Beginning Spanish I to enter Beginning Spanish II (1002) with the same expected knowledge base and familiarity with the materials as those who took Beginning Spanish I (1001). Students who place into 1002, while having demonstrated a higher level of proficiency in the language, are disadvantaged to the extent that they enter a course already in progress, with a specific text book and materials the first half of which they have not covered. Regardless, it is assumed that they have mastery of the specific themes, structures and vocabulary covered in the first half of the book/materials.

To that end, the discipline has designed a new course specifically tailored for these students. This will essentially be a one semester course designed for beginning students with a higher level of proficiency, that will move at a faster pace, using alternate materials so as not to make assumptions about the previous experience of specific materials covered. The traditional 1001/1002 course sequence will remain for those students who need both semesters to complete the FL requirement. 1003 will be reserved for students who have demonstrated sufficient proficiency to complete the FL requirement with one semester of course work. The Twin Cities campus has already done this and actually offers more sections of this new course than the equivalent of our second semester Beginning Spanish II 1002 course.

In response to the request (below) from the Assessment of Student Learning Committee, we assessed the General Education Foreign Language requirement by examining Beginning Spanish II (1002), the completion of which students need in order to fulfill the Foreign Language requirement of the General Education Requirements.

**ASSESSMENT MEASURES**

In order to begin to gauge the effectiveness of the new proposed 1003 course, we conducted an assessment of fall and spring semesters' Spanish 1002 courses by re-administering the Spanish Placement Exam. The faculty members who taught Spanish 1002 in the fall and spring reserved one or two days towards the end of each semester to allow us to re-administer the Spanish Placement Exam.

**THE ASSESSMENT RESULTS**

We administered the Spanish Placement Exam to eighty (80) students in all eight sections of Beginning Spanish II (1002) to gauge into which Spanish level they placed. Logically, they should place into Intermediate Spanish I (2001) upon completing Beginning Spanish II (1002).

| Placement Level | Number of Students |
|---|---|
| 1001 | 17 |
| 1002 | 18 |
| 1003 | 19 |
| 2001 | 25 |
| 3011/3011 | 1 |

The average/mean placement score was 277.95.

Given that only 31% (25 out of 80) of the assessed students placed into what would be considered the appropriate level (2001) suggests that we need to re-assess this once we have instituted the Accelerated Beginning Spanish (1003) course in the fall of 2013. We may need to implement additional strategies in order to propel our students to the appropriate level.

For the Beginning Spanish II (1002) classes, we also created the following Learning Objectives:
1. Students will recognize and appreciate the complexity of language systems as a means to human communication.
2. Student will have an improved command of their native language (most likely, English) through the study of Spanish.

At the same time that we re-administered the Spanish Placement Exams, we asked the students to anonymously answer the following questions:

1. Do you have a better understanding of the complexity of language systems through your study of Spanish?
2. Has your command of your native language (English) improved through your study of Spanish? If so, please provide an example.

**ASSESSMENT OF RESULTS**

To question #1 (Do you have a better understanding of the complexity of language systems through your study of Spanish?), of the seventy-nine (79) students who participated in the assessment, 76 (96%) responded YES and 3 (4%) responded NO.

To question #2 (Has your command of your native language improved through your study of Spanish?), of the same seventy-nine (79) students who participated in the assessment, 42 (53%) responded YES and 37 (47%) responded NO. Of those who responded YES, we have included some of the more thoughtful examples they provided.

- It makes me realize the complexity and necessity of clarity while speaking/writing in English.
- In general it makes me more aware of my grammar and why I construct sentences the way I do.
- It has made me look more critically at sentence structure.
- Yes, because it helps me to think of different words. Sometimes when I have to answer a question, I will think about how to say it in Spanish and it helps to expand my vocabulary.
- Seeing how many cognates there are from Spanish to English made [me] recognize all the common roots and items in other English words.
- My choice of words and appropriateness has [have] improved.
- In class we went over the different verb tenses. I was able to better understand the preterit and imperfect and it has noticeably helped me in writing papers in English for other courses.
- Spanish has helped me realize/pay more attention to word order and grammatical structure while using English.
- The study of sentence structure in Spanish has made me more aware of how I speak in English.

## Chemistry Assessment

Student performance in General Chemistry I (CHEM 1101) and General Chemistry II (CHEM 1102) courses was assessed by 1) analysis of ALEKS online homework in one lecture section of CHEM 1101, 2) Analysis of student performance on multiple choice questions designed to measure how well they learned material from the lab segment of the course from the other CHEM 1102 lecture sections, and 3) assessment of work done by students in the CHEM 1102 laboratory based on twice-per-semester open-laboratory- notebook quizzes.

Some topics that seem to need attention are simple chemical reactions, thermochemistry, and spectroscopy in CHEM 1101 and rate laws and electrochemistry in CHEM 1102.

**Chemistry 1101 – General Chemistry I**

Chem 1101 satisfies the Physical and Biological Sciences (Sci-L) requirement of the 60 credit General Education requirement for your degree completion. The objective of this requirement is to *increase students' understanding of the physical and biological worlds and to gain exposure to the use of scientific methods*.

Students' understanding was assessed, in part, with ALEKs – an online assessment tool. ALEKS (Assessment and LEarning in Knowledge Spaces) is a web-based, artificially intelligent assessment and learning system. The program was used to assess and reassess students' knowledge of important CHEM 1101 topics and concepts.

There are two "modes" in ALEKS: the Assessment Mode and the Learning Mode. In the Learning Mode, students complete "Objectives" designed by the instructor. An ALEKS Objective contains a list of topics relevant to the current lecture discussions and assigned reading. Once students consistently get the problems for a given topic correct, ALEKS considers that he/she has learned the topic, and the student may then choose another topic to learn.

A total of 10 "Objectives" (or "Units") were created in the course. The results for Fall 2012 (based on one section of 105 students) are as follows:

| | |
|---|---|
| Objective One | 96% Mastered |
| Objective Two | 90% Mastered |
| Objective Three | 88% Mastered |
| Objective Four | 70% Mastered |
| Objective Five | 44% Mastered |
| Objective Six | 52% Mastered |
| Objective Seven | 69% Mastered |
| Objective Eight | 70% Mastered |
| Objective Nine | 68% Mastered |
| Objective Ten | 61% Mastered |

These results suggest that concepts present in Objectives Five and Six were problematic based on low levels of mastery. To gain more insight into this data, we analyzed specific mastery topics/concepts:

| | |
|---|---|
| Math and Algebra | 97% Mastered |
| Measurement | 96% Mastered |
| Matter | 92% Mastered |
| Atoms, Ions and Molecules | 89% Mastered |
| Stoichiometry | 72% Mastered |
| Simple Reactions | 45% Mastered |
| Thermochemistry | 51% Mastered |
| Electronic Structure | 69% Mastered |
| Chemical Bonding | 67% Mastered |
| Advanced Material | 27% Mastered |

These results show that *Simple Reactions, Thermochemistry*, and *Advanced Material* provided the most difficulty for students. As a result of this data, we were able to look at specific questions within these categories that had low levels of mastery. Based on these assessment data, changes will be made to the course to improve student learning: additional examples will be worked in lecture and problems will be provided as homework to improve mastery of these topics. For example, within the topic of *Simple Reactions*, the following specific topics will be more fully addressed:

*Writing the half-reactions of a metal-nonmetal reaction*
*Writing the half-reactions of a single-displacement reaction*
*Predicting the products of the reaction of a strong acid with water*

In the Assessment Mode, ALEKS asks students questions designed to determine what each student knows and what skills they have. The first time a student logs into ALEKS he/she is automatically placed in the assessment mode to complete an *Initial Assessment* of their knowledge of chemistry and math. At the end of the course, a student completes a final assessment. Results of the initial and final assessments are found below:

| **Assessment** | **Average Student Mastery (%)** |
|---|---|
| Initial Assessment | 19% |
| Final Assessment | 80% |

These data show that although students came into the course with some mastery of the material, much of the material was mastered as a result of taking this course and the activities related to the course.

**Assessment of General Chemistry Lab based on multiple-choice questions given in lecture.**

In a second CHEM 1101 general chemistry lecture section of 104 students, exam questions were designed to measure content from the laboratory section of the course that was retained by students.

These questions on each test are shown below.

**TEST 1: Class average was 73%**

What is the density of a piece of metal that displaces 1.54 mL of water and has a mass of 12.120 g?

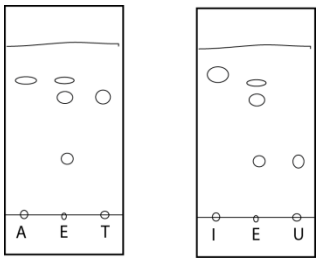
a. 0.127 g/$cm^3$
b. 1.27 g/$cm^3$
c. 18.7 g/$cm^3$
d. 7.87 g/$cm^3$
e. 7.9 g/$cm^3$

*92.4% of 105 students answered this question correctly.*

**TEST 2: Class average was 80.5%**

1. The picture on the left shows the result of a thin layer chromatography experiment with aspirin (A), Excedrin (E), and acetaminophen (T), dotted on the same slide. The slide on the right shows Excedrin (E) dotted with ibuprofen (I) and an unknown (U). What is the identity of the unknown?

a. aspirin
b. acetaminophen
c. Excedrin
d. ibuprofen
e. caffeine




*91.3% of 103 students responded correctly.*

2. Calcium carbonate in a 1.298 g antacid tablet reacts with excess hydrochloric acid to produce 0.154 g or carbon dioxide according to the equation below.

$$CaCO_3\ (s) + 2\ HCl\ (aq) \rightarrow CaCl_2\ (aq) + CO_2\ (g) + H_2O\ (l)$$

What percent calcium carbonate by mass was the tablet? Choose the correct answer with correct significant figures.

a. 33.4 % b. 33 % c. 27.0 % d. 13.0 % e. 100. %

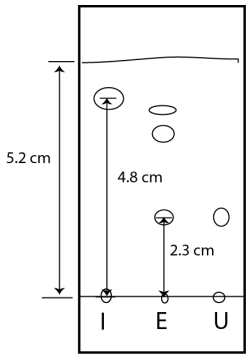
*63.1% of 103 students responded with the correct choice, c.*

3. An unknown solid is found to have a melting range from 127.1 $^{o}$C to 129.3 $^{o}$C. It dissolves slightly in water and completely in ethanol but does not dissolve in hexanes. What is the identity of the solid based on the information in Table 1 above?
    a. Acetanilide
    b. 2-Thiophenecarboxylic acid
    c. Biphenyl
    d. Acetamide
    e. Benzamide

    *98.1% of 103 students responded with the correct choice, e.*

4. Based on the TLC plate depicted below the respective $R_f$ values for ibuprofen and caffeine are

    a. 0.92 and 0.44
    b. 1.1 and 2.3
    c. 2.1 and .48
    d. 4.8 cm and 2.3 cm
    e. 5.2 cm and 2.3 cm




*87.4% of 103 students responded with the correct choice, e.*

**TEST 3: Class average was 71%**

1. A strip of magnesium metal is placed in hydrochloric acid. Make the correct prediction by using the activity series.
    a. No reaction

    b. $Mg\ (s) + 2\ HCl\ (aq) \rightarrow MgCl_2\ (aq) + H_2\ (g)$

    c. $MgCl_2\ (aq) + H_2\ (g) \rightarrow Mg\ (s) + 2\ HCl\ (aq)$

    d. $Mg\ (s) + 2\ HCl\ (aq) \rightarrow MgH_2\ (aq) + Cl_2\ (g)$

    e. $Mg\ (s) + 2\ HClO\ (aq) \rightarrow MgCl_2\ (aq) + H_2\ (g) + O_2\ (g)$

    *88.8% of 98 students responded with the correct choice.*

2. From the balanced equation we know that two moles vanillin (152.149 g/mol) reacts with two moles of triethylamine (d = 0.726 g/mL, FW =101.191 g/mol) and one mole of oxalyl chloride (d = 1.455 g/mL, FW = 126.926 g/mol) to yield one mole of divanillyl oxalate (358.304 g/mol) and two moles of a chloride salt.

   If 0.302 g of vanillin in toluene are reacted with 0.750 mL of triethyl amine and 235 μL of oxalyl chloride and 0.285 g of dry divanillyl oxalate are recovered, the limiting reactant, theoretical yield, and percent yield are
   a. Vanillin, 0.355 g, and 80.3 % respectively.
   b. Triethyl amine, 0.964 g, and 29.6 % respectively.
   c. Oxallyl chloride, 0.965 g, and 29.5 % respectively.
   d. Vanillin, 0.355 g, and 128 % respectively.
   e. Oxallyl chloride, 0.663 g, and 43.0 % respectively.

   *78.6% of 98 students answered this question correctly.*

3. Three test tubes, with no labels are in a test tube rack on the laboratory bench. Lying beside the test tubes are three labels: KI (aq), $AgNO_3$ (aq), and $Na_2S$ (aq). When a portion of test tube 1 is added to a portion of test tube 3 a yellow silver iodide precipitate is formed. A portion of test tube 2 is added to test tube 3 and a black precipitate, silver sulfide, is formed how should the test tubes be labeled?
   a. test tube 1 = $Na_2S$ (aq), test tube 2 = KI (aq), test tube 3 = $AgNO_3$ (aq)
   b. test tube 1 = KI (aq), test tube 2 = $AgNO_3$ (aq), test tube 3 = $Na_2S$ (aq)
   c. test tube 1 = $Na_2S$ (aq), test tube 2 = $AgNO_3$ (aq), test tube 3 = KI (aq)
   d. test tube 1 = KI (aq), test tube 2 = $Na_2S$ (aq), test tube 3 = $AgNO_3$ (aq)
   e. test tube 1 = $AgNO_3$ (aq), test tube 2 = $Na_2S$ (aq), test tube 3 = KI (aq)

   *80.6% of 98 students answered this question correctly.*

4. Which is the result when NaOH (aq) and $MgCl_2$ (aq) solutions are mixed?
   a. No reaction
   b. Ammonia gas turns moist red litmus paper held above the reaction mixture blue.
   c. $Mg(OH)_2$ (s) forms as a cloudy precipitate
   d. $Cl_2$ (g) gas is evolved
   e. NaCl (s) precipitate forms

   *80.0% of 98 students answered this question correctly.*

5. A mass of 0.4113 g of an unknown acid, HA, is titrated with NaOH. If the acid reacts with 28.10 mL of 0.1055 M NaOH(aq), what is the molar mass of the acid?
   a. $2.965 \times 10^{-3}$ g/mol
   b. 9.128 g/mol
   c. 138.7 g/mol
   d. 337.3 g/mol
   e. 820.7 g/mol

   *84.69% of 98 students answered this question correctly.*

6. A 25.00 mL sample of NaOH is titrated with 26.14 mL of 0.1750 M HCl (aq). What is the concentration of the NaOH solution?
   a. 1.995 x $10^{-4}$ M
   b. 0.09149 M
   c. 0.1830 M
   d. 0.1674 M
   e. 0.08945 M

   *84.69% of 98 students answered this question correctly.*

**TEST 4: Class average was 76%**

1. Cranberry juice has a red color. Which of the following statements are true?
   I. Cranberry juice absorbs red light.
   II. Cranberry juice absorbs green light.
   III. Cranberry juice transmits red light.
   a. Only statement I is true.
   b. Only statement II is true
   c. Only statements III is true.
   d. Statements I and II are true and statement III is false.
   e. Statements II and III are true but statement I is false.

   *85.29% of 102 students answered this question correctly.*

2. Energy from the reaction of an oxalate ester with hydrogen peroxide is transferred to a rubrene dye molecule placing it into an electronic excited state. The excited electron in the dye molecule relaxes down to the ground electronic state. Which statement is FALSE?

   a. The rubrene dye molecule absorbs a photon in this process.
   b. This is an example of a chemiluminescence.
   c. The dye molecule in an excited electronic state has more energy than in its ground electronic state.
   d. When the rubrene dye molecule relaxes from an excited electronic state to the ground electronic state a photon is released.
   e. Emissions spectroscopy can be used to study this process.

   *47.06% of 102 students answered this question correctly.*

3. Possible energies of an electron in a hydrogen atom are $-Rhc/n^2$, where n, the principle quantum number, is a positive integer and Rhc = 2.179 x $10^{-18}$ J. When the electron jumps from the state with n = 5 to the state with n = 2

   a. the electron loses energy by emitting a photon with wavelength 434.1 nm.
   b. the electron gains energy by emitting a photon with wavelength -434.1 nm.
   c. the electron loses energy by absorbing a photon with energy 4.576 x $10^{-19}$ J.
   d. the electron gains energy by absorbing a photon with energy 4.576 x $10^{-19}$ J.
   e. the electron loses energy by absorbing a photon with energy -4.576 x $10^{-19}$ J.

   *38.24% of 102 students answered this question correctly.*

4. A student *wearing lab goggles* dilutes 100. mL of a $4.26 \times 10^{-5}$ M aqueous solution of capsaicin to the mark in a 250. mL volumetric flask. What is the molarity of the diluted capsaicin solution?
    a. $1.70 \times 10^{-5}$ M
    b. $1.07 \times 10^{-4}$ M
    c. $9.39 \times 10^{4}$ M
    d. $5.89 \times 10^{5}$ M
    e. 3.04 M
    f. $2.50 \times 10^{-5}$ M

    *85.29% of 102 students answered this question correctly.*

**Summary of student learning in General Chemistry Laboratory as assessed by multiple-choice questions on tests given in General Chemistry Lecture.**

1. Students did better on questions based on laboratory concepts than the overall average on the test.
2. Students did better on answers based on qualitative tests performed in the lab than they did on questions based on quantitative calculations performed in the lab.
3. Students performance on questions based on quantitative computations performed in the lab improved during the semester.
4. Students did far worst on questions related to spectroscopic experiments performed in the lab. Clearly this should be a focus of attention.

**Chem 1102 Assessment – Part 1**

Final Exam: Standardized ACS (American Chemical Society) Exam for Second Semester Gen Chem. Several Questions tie directly to lab experiments or procedures. These were also tested on prelabs and mid semester lab exams. Exact questions cannot be disclosed.

There is a prelab quiz on Moodle which is due at noon on Monday for the lab being performed that week. This ensures that the students have thought about the theory, done some background reading and/or run calculations on sample data before doing the experiment. In a typical week 95% of students (~150) had the prelab done on time.

Each lab begins with a prelab lecture to reinforce the chemistry and demo particular procedures/equipement.

Twice during the semester the students are given an 'open notebook' quiz to test whether they are keeping good notebooks and understanding the chemistry of the labs.

Highlighted in yellow are the % of UMM students with the correct answer/% from ACS Composite norms. In most cases UMM>national. Highlighted in blue is the % of UMM students who answered a similar question on a Moodle prelab. From #1 below -- A good question to investigate is why students did so well on the prelab question about rate but struggled with the ACS Final Exam question (although still besting the national score by 10%).

From #4 below -- We might be able to comment that students do not retain the background reading without the reinforcement of a pre or post lab question.

1) ACS Questions related to Exp 6 -- Rate Laws – 46.5%/37%; Prelab 6 Q 2 – 95.0% ; Lab Quiz 1 Q 10
2) ACS Question related to molarity calc – 73.6%/72.5%; Prelab 10 Q 1 – 73.8%
3) ACS Question related to titration Exp 8. Titration Curve SA and SB – 72.2%/63.4%; Prelab 8 Q 1 – 65.9% ; Lab Quiz Q3
4) ACS Question related to electrochemisty Exp 12 Std. Red. Pot.– 48.6%/58.6%; Prelab background reading
5) ACS Questions related to safety/procedure – 77.7%/62.6%, – 79.2%/57.1%; Syllabus and day one lab presentation

**Chem 1102 Assessment – Part 2**

SCI-L Assessment – Lab Focus – Chem 1102

144 students took lab quiz number 2 on the last day of instruction.

| Experiment | Number of Correct Answers[3] | % Correct Answers |
|---|---|---|
| 7 Equilibrium constant of a complex ion | 108 | 75 |
| 8 Titration curve of a strong acid/strong base | 59 | 41 |
| 9 Equivalence point by conductivity | 79 | 55 |
| 10 Acidity constant of mandelic acid | 82 | 57 |
| 12 Standard reduction potentials | 41 | 28 |
| On accuracy vis-à-vis precision | 106 | 74 |

Comments. The calculation done for Experiment 7 was the lengthiest for all the experiments. All that students needed was the detailed calculation for their measurements, and it appears that most did.

Electrochemistry is the penultimate topic for spring semester, and the ultimate in a long series of chapters on equilibrium and thermodynamics. It is the most complicated of all in the sense that it builds on everything that has preceded it. Experiment 12 is the last of the semester; the procedure is attractively simple, but interpretation of the results is subtle. I conjecture that the low score for Experiment 12 is due to a combination of three factors, viz., the intrinsic difficulty of electrochemistry, the fact that it is taught so late in the semester, and the subtlety of interpreting the lab results.

Chem. 1102 Lecture: Results on the ACS Standardized Final Exam for Semester 2.
Average = 40.8 ± 9.8 out of 70 questions. Range 25-63. Number of students = 68. The course grade distribution was A = 14; B+/B/B- = 20; C+/C/C- = 30; D = 2; F = 3. Total = 69, as one F student did not take the final.

[3] For the first five entries, correct means the student earned 4-5 points out of 5; incorrect 0-3. For the last entry, correct means 4 out of 4; incorrect, 0-3.

## Mathematics Assessment

*Goals of the Mathematical/Symbolic Reasoning (M/SR) General Education requirement: To strengthen students' ability to formulate abstractions, construct proofs, and utilize symbols in formal systems.*

## 1 Assessment of students' abilities to formulate abstractions

Students formulate abstractions by constructing a variety of types of graphs that represent underlying physical systems (for example, the traveling salesman problem and task scheduling using order requirement digraphs).

1. **Assessment**

   **a)** Give an example of a job that is made up of at least 8 tasks, and for which at least 2 of the tasks depend on other tasks. Determine your best estimate of the time necessary to complete each task. Finally, construct an order requirement digraph for the job.

   **b)** For the order requirement digraph you created in Part a), identify the earliest completion time of the job from your order requirement digraph. Then, schedule the tasks on three processors using critical path scheduling.

   Answers will vary, but each answer should include:

   - a) will include:
     - list of tasks and times
     - order requirement digraph, which shows the dependencies between the tasks
   - b) will include:
     - earliest completion time (by identifying critical path in your order requirement digraph)
     - priority list created using critical path scheduling
     - a schedule on three processors, created using the list processing algorithm.

   *In this problem, you are trying to come up with your own example of a good order requirement digraph that you could potentially use to explain the concept to other people, so try to think of a job that can be done by more than one person. For example, doing laundry is not a good example because the order requirement digraph is too "linear"–each task in the job leads directly to the next task, and other than folding laundry their really isn't much for a second person to do. Laundry is also confusing because the processors are humans and machines–and having two different types of processors could lead to confusion. A good example would be a job that has many small tasks that can be worked on concurrently by more than one person, and then some tasks that depend on a few of the small tasks to be completed before they can be started. All the tasks should be things that a person could do, so your processors are all people.*

| | Good (A-B) | Fair (C) | Poor (D-F) |
|---|---|---|---|
| Number of students | 17 | 5 | 8 |
| Percentage of students | 56% | 16% | 26% |

**Table 1:** Assessment of students' abilities to formulate abstractions.

Fair: Students did not construct examples that met the stated requirements, but analyzed their example correctly. Poor: Students did not construct examples that met the requirements, and then did not analyze their example correctly.

2. Feedback

Considering students' ability on this assessment:

- Were any changes made to the assignment?
- If necessary, were any changes made to the course to better assist students in understanding this particular concept?

This question was rewritten this year to include more explanation of the requirements for a complete solution, and the class performed better on this question than in previous years. No further changes to the question are planned at this time.

## 2 Assessment of students' abilities to construct proofs

Students do not construct formal proofs in this class, however, they do many activities that require a detailed and precise explanation of a mathematical result.

1. **Assessment**

   Draw an object that has only two lines of reflection symmetry, and one rotational symmetry (exclude the stay-put symmetry). Demonstrate the symmetries of your object.

   Can you draw an object that has only two rotational symmetries and only one reflection symmetry (exclude the stay-put symmetry)? Explain your answer.

| | Good (A-B) | Fair (C) | Poor (D-F) |
|---|---|---|---|
| Number of students | 15 | 8 | 3 |
| Percentage of students | 57% | 30% | 11% |

**Table 2:** Assessment of students' abilities to construct proofs.

   Fair: For the second part of the question, students correctly determined that no such object can be drawn, but had difficulty explaining their answer.

   Poor: Students had difficulty understanding the difference between rigid motion and symmetry.

2. **Feedback**

   Considering students' ability on this assessment:

   - Were any changes made to the assignment?
   - If necessary, were any changes made to the course to better assist students in understanding this particular concept?

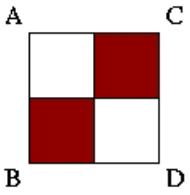
   No changes are planned to the assignment, nor the instruction of this topic. This question occurs early in the symmetry unit and students who have difficulty understanding the difference between symmetry and rigid motion are able to understand the difference by the time they take the unit test.

3. **Reassessment in same class**

   Two questions from the unit test on symmetry allow students to demonstrate their knowledge of the difference between rigid motions and symmetries:

**Question** Demonstrate each of the 4 rigid motions (not symmetries, just the rigid motions) on the given object.

- translation in a direction
- reflection about a line
- rotation about a point
- glide reflection




**Question** Clearly demonstrate any four of the rigid motion symmetries (excluding stay-put) of the equilateral triangle. "Demonstrate" means clearly indicate how the shape changes under the given rigid motion.

| | Good (A-B) | Fair (C) | Poor (D-F) |
|---|---|---|---|
| Number of students | 17 | 8 | 1 |
| Percentage of students | 65% | 30% | 4% |

**Table 3:** Reassessment of students' abilities to construct proofs.

## 3 Assessment of students' abilities to utilize symbols in formal systems

Students utilize symbols in formal systems when they examine rigid motion symmetries of objects.

1. **Assessment**

   (a) Demonstrate each of the seven rigid motion symmetries of the square (if you include the stay put transformation, you get eight total rigid motion symmetries).

   (b) Construct a partial Cayley table for the rigid motion symmetries of the square, filling in the portion that shows:

   - all combinations of rotations,
   - combinations that lead to the identity element, and
   - at least one entry that deals with a combination of two reflections.

   Note that the table is not too large, so you could go ahead and fill in the entire Cayley table.

| | Good (A-B) | Fair (C) | Poor (D-F) |
|---|---|---|---|
| Number of students | 20 | 3 | 3 |
| Percentage of students | 77% | 11% | 11% |

**Table 4:** Assessment of students' abilities to utilize symbols in formal systems.

   Fair: Students demonstrated an understanding of the underlying concepts, but had errors in constructing parts of the Cayley table.

   Poor: Students did not understand conceptually how rigid motions related to groups via Cayley tables.

2. **Feedback**

   Considering students' ability on this assessment:

   - Were any changes made to the assignment?
   - If necessary, were any changes made to the course to better assist students in understanding this particular concept?

No changes are planned to the assignment, nor the instruction of this topic.

**Physics Assessment**

Specific General Education Courses:

1. Phys 1101 General Physics I

   Prof. Boyd has carried out extensive analyses of the five graded components of the course in order to ascertain how the various components (tests, labs, quizzes, homework, and online learning checks) are contributing to student learning. The report is attached.

   The low correlation between student performance on some of the components and student performance on exams raises many interesting questions about the purpose and efficacy of the various course components. These are questions for not only Prof. Boyd but for all the physics faculty to consider going forward.

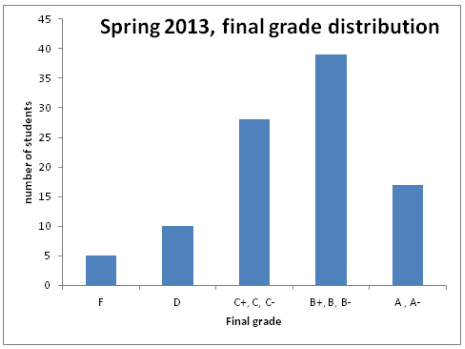
2. Phys 1102 General Physics II

   Prof. Korth has continued to analyze the progress made by students over the course of the semester as they work with vectors. This has been discussed in past assessment reports. It has been found repeatedly that only 50 to 60% of the students of the students exhibit mastery of vectors on the first quiz and that urging them to practice, doing more examples, and explicitly informing them vector addition will be on the quiz make little difference. By the time of the final exam, 90% of the students exhibit mastery of vectors suggesting that repetition and “failure” may be more effective than handouts and exhortation.

Analysis of practices in Phys1101, General physics 1:

Students are graded according to 4 tests (50%), 12 quizzes (15%), 12 lab experiments (25%), 15 homework assignments (5%) and 45 online learning checks (5%). While the first two items have primarily a testing character, all other items fulfill testing as well as instructional functions. This analysis of correlation assesses the effectiveness of these functions. Primary goal is to use all of these functions to enhance student learning, as well as use faculty time most effectively to further that goal.

The final grade distribution for Phys1101, spring 2013 is as follows:




Two-week enrollment: 105

Several interesting observations based on the analysis of course data:

1. The lab score appears uncorrelated to test and quiz scores. Tests and quizzes do only sometimes refer to lab skills. However, there is a concern that the lab experiments do not enhance understanding or problem solving skills that are sought in tests and quizzes.
2. The homework scores are generally high, and appear uncorrelated with any other scores, such as tests and quizzes. The homework assignments should help students acquire the problems solving skills, however, it is too easy to turn in correct solutions without having undergone the part in which these skills are practiced (group work, PAL sessions, access to solutions are sometimes really counterproductive!). While it is essential to acquire and practice these skills outside of class – graded homework assignments appear to not do the trick.
3. The scores of online learning checks are uncorrelated with scores on any other component of the course. While they are valuable as discussion starters and perhaps an access to conceptual thinking, mostly the score appears to not correlate with enhanced student learning of problem solving and analytics. Their part should be reduced to 2% of total score – no more.

The logical steps from here would be to:

a) Stop grading homework – but a different mechanism for problem solving skills must be found. The expected smaller class size for next spring may be helpful in getting back more in-class practice.
b) Review the connection between lab and lecture. That is a long-term project.
c) Perhaps include more analytical work into the online learning checks.

Dangers: students must learn to present their work completely and coherently. Online tricks do not challenge them to do so.

## Statistics Assessment

**GENERAL EDUCATION: Statistics Service Courses/Introductory Level Courses**

• ***LEARNING CHECKS:*** *Thirty learning checks are designed covering all the key concepts in statistics. Target group is all students taken the first course in statistics (Stat. 1601 "Introduction to Statistics" and Stat. 2601 "Statistical Methods". The students' performances on these checks are not graded, but all of the students are required to take them. This assessment tool may be viewed at* *http://www.morris.umn.edu/~sungurea/introstat/assessment1601/assessment1601.html. Learning checks are designed to pinpoint the key concepts/issues and common mistakes.*
***Starting year of implementation:*** 1997
***Implementation frequency:*** Every semester, all first courses in statistics
***Size of database as of Spring 2007:*** 3,986
***Type of assessment:*** Cognitive; direct conceptual

• ***RETENTION OF STUDENT LEARNING STUDY:***

This investigation aims to measure the amount of information and the types of skills students retain from their introductory statistics courses. The study primarily tests the hypothesis related to the post and present performance of the students. Furthermore, it is hypothesized that knowledge retention will be highest for recognition tasks and lowest for problem-solving tasks. Additional hypotheses are developed based on (i) the instructional strategies employed, and (ii) other individual differences between students such as major, interest, prior knowledge of statistics, etc.

Students who completed the course in the past are retested with a new version of the comprehensive final exam from the class they took. The new form of the exam asks all the same questions with only minor changes, and it are graded in the same manner as the original. Students also complete a detailed questionnaire that includes background information on other variables such as gender, major, prior knowledge of statistics, interim exposure to statistics, etc. The students are asked not to do any special studying of statistics prior to the new test.

Since, only 20 students per comparison group are needed to obtain statistical power above .80 for basic statistical tests under fairly conservative assumptions (mean difference of >.75 SD), 50 students are randomly selected from the pool. The study aims to compute a "relative loss" estimate, which will serve as the dependent variable. However, because some students have taken the class the previous semester, while others may have taken it as long ago as five or six years the hypothesized relative loss rates for different groups of students must be stated as a function of time. Specifically, average relative loss rates are hypothesized to fit non-linear, non-decreasing functions of time elapsed since the course was taken (Semb, 1994). The exact shape of the hypothesized functions will be worked out in detail during the literature review, but based on an initial review of studies of both retention in mathematical subjects and basic theories of forgetting they are expected to be negative exponentials of the form:

$$L = A - Ae^{-T/R}$$

where $L$ is relative loss, $T$ is time, $A$ is the asymptotic relative loss (relative loss after an infinite period of time), and $R$ describes how quickly $L$ approaches $A$. Different values for these parameters will be hypothesized for each group of student (such as A- students, B-students, etc.) prior to data collection. Also, once parameter estimates are obtained from the sample, this function will be used to transform scores to correct for time when performing t-tests.

This study provides a valuable addition to research on retention for several reasons. First, statistics is a relatively new and small field of instruction and research on retention of statistics-area information is sparse. Second, introductory courses in statistics are required for students in a number of majors at UMM. This provides a population of students whose statistical knowledge is mostly a result of introductory statistics courses offered at UMM. Third, statistics is a relatively straightforward content area to test, with well-defined right and wrong answers. This precision will help limit testing error and provide a more reliable measure of relative information loss. Finally, the ever increasing need for statistical understanding in areas like medicine and law makes the retention of statistical knowledge particularly important (Gigerenzer & Edwards, 2003).

The preliminary results of the study are given below:

For the study 50 students are randomly selected from all sections of introductory statistics courses. The response rate was 96% (48 responses).
*On the average students finished the course 2.5 years ago.
*The average score on the new exams was 39.56%. This was mostly due to poor performance on certain items such as hypothesis testing, proportions, and confidence intervals. Almost nobody got the question about turning a correlation into a "percentage of variation explained by regression" correct. Some of the students seemed to have difficulty understanding the instructions, and very few students seem to understand the Popperian logic of non-bayesian hypothesis testing (i.e. many wrote things like "these numbers are not significant, so the null is true"). On the other hand students did really well on probabilities.
*At this point one of the instructor's student retention performance has been completed. The average relative loss for these students was 60% (note that a student who scored 100 and now scores a 50 has the same relative loss as a student who scored an 80 and now scores a 40). This seems a bit high, but it can be explained in part by (a) the fact that the instructor may have awarded more partial credit when s/he grade the exams than the project investigator did, (b) students were not provided with formula sheets as would have been allowed on the in-class exam, (c) students were instructed to NOT study before taking the exam and (d) many students seemed to lose interest in the online exam toward the end, when the harder 10-point questions came up. Very few students did well on these last 2 questions, and we think this was in part due to lack of interest in taking the exam. If this theory is right, then some students should show lower relative loss due to differences in examinations between instructors, since their exams are multiple-choice, and requires varying effort from students.
*Here are the performance breakdowns by professor (standard deviations in parentheses):

| | | |
|---|---|---|
| Instructor 1 | 34.2% | (15.84) |
| Instructor 2 | 36.1% | (12.65) |
| Instructor 3 | 48.2% | (17.85) |
| Instructor 4 | 29.5% | (17.85) |

*The better performance of one of the instructor's students can be explained with the difficulty of the exam.

There was surprisingly little reliable trend by year. Here are the year breakdowns:

SCORE

| YEAR | Mean | N | Std. Deviation |
|---|---|---|---|
| 2002 | 36.74 | 1 | . |
| 2003 | 43.55 | 10 | 23.57 |
| 2004 | 44.25 | 15 | 18.83 |
| 2005 | 30.29 | 15 | 14.36 |
| 2006 | 44.03 | 7 | 11.83 |
| Total | 39.55 | 48 | 18.23 |

On the other hand the trend by final course grade was stronger:

SCORE

| GRADE | Mean | N | Std. Deviation |
|---|---|---|---|
| 2.00 | 22.6667 | 3 | 12.50333 |
| 3.00 | 33.6988 | 6 | 17.04494 |
| 3.33 | 39.7199 | 4 | 29.47776 |
| 3.67 | 36.6976 | 5 | 14.85357 |
| 4.00 | 49.2342 | 13 | 15.88102 |

The most striking observation is the jump in the student's retention when we move from A- to A's.

*Females actually did marginally better than males, although this is not significant.

SCORE

| SEX | Mean | N | Std. Deviation |
|---|---|---|---|
| Female | 40.3126 | 35 | 18.24078 |
| Male | 37.5175 | 13 | 18.79765 |
| Total | 39.5556 | 48 | 18.23427 |

*Here is a breakdown by final course grade:

RELATIVE_LOSS

| GRADE | Mean | N | Std. Deviation |
|---|---|---|---|
| 2.00 | 34.67 | 3 | 9.815 |
| 3.00 | 40.67 | 3 | 10.504 |
| 3.33 | 59.00 | 2 | 9.899 |
| 3.67 | 55.50 | 3 | 8.352 |
| 4.00 | 48.09 | 5 | 20.117 |
| Total | 46.93 | 16 | 14.960 |

As one can observe, the relative loss has a hump shape, with B+ students losing the most material. However there is a high variation from one student to the other. An interesting hypothesis that has been formed to test is "some students have mastered the art of getting A's without actually learning, while other students really learn the concepts and it sticks with them".
*Correlation between their new score and their final course grade is .439, p=.014.

*Learning Checks: The performance of the students on various topics covered in general education statistics courses is given in the table below. The results pinpoint the topics that need to be studied from both content and pedagogical point of views to improve student learning:

| *Section* | *Concept* | *Sample Size* | *Mean* | *Standard Deviation* |
|---|---|---|---|---|
| 1.1 | Displaying Distributions | 404 | 78.83 | 21.99 |
| 1.2 | Describing Distributions | 375 | 76.02 | 20.43 |
| 1.3 | Normal Distributions | 352 | 78.87 | 19.82 |
| 2.1 | Scatterplots | 282 | 86.79 | 20.35 |
| 2.2 | Correlation | 299 | 63.29 | 22.64 |
| 2.3 | Least-Squares Regression | 250 | 57.70 | 28.04 |
| 2.4 | Cautions @ Regress & Corr | 199 | 63.34 | 25.80 |
| 2.5 | The Question of Causation | 139 | 67.62 | 32.89 |
| 3.1 | First Steps | 229 | 76.12 | 22.94 |
| 3.2 | Design of Experiments | 227 | 91.10 | 15.05 |
| 3.3 | Sampling Design | 256 | 55.94 | 26.73 |
| 3.4 | Toward Statistical Inference | 212 | 81.57 | 21.02 |
| 4.1 | Randomness | 261 | 78.73 | 30.66 |
| 4.2 | Probability Models | 305 | 59.67 | 26.40 |
| 4.3 | Random Variables | 206 | 78.74 | 21.65 |
| 4.4 | Mean and Var of Rand.Vars | 193 | 70.47 | 26.56 |
| 4.5 | Probability Laws | 173 | 67.87 | 26.86 |
| 5.1 | Counts and Proportions | 193 | 61.90 | 21.16 |
| 5.2 | Sample Means | 232 | 69.93 | 28.65 |
| 6.1 | Estimating with Confidence | 278 | 68.20 | 27.49 |
| 6.2 | Tests of Significance | 250 | 74.44 | 22.01 |
| 6.3 | Use and Abuse of Tests | 164 | 81.71 | 19.60 |
| 7.1 | Inference => Mean of Pop. | 245 | 65.20 | 27.18 |
| 7.2 | Comparing Two Means | 185 | 69.05 | 32.32 |
| 8.1 | Inference for a Single Prop. | 167 | 74.25 | 27.50 |
| 8.2 | Comparing Two Proportion | 215 | 68.49 | 27.20 |
| 9.1 | Inference Two Way Tables | 144 | 75.35 | 28.66 |
| 9.2 | Form/Models for Two Way | 152 | 62.66 | 26.37 |
| 10.1 | Simple Linear Regression | 120 | 61.80 | 27.03 |
| 12.1 | One-Way ANOVA | 87 | 57.78 | 26.99 |
| | | | | |

**Gender, Women, & Sexuality Studies Assessment**

Sociology 3121: Sociology of Gender & Sexuality (meets the general education requirement of HDIV)

Learning outcome assessed: Intellectual and Practical Skills

Items assessed: Analytical writing assignments, research project, and in-class discussions

Summary of observations of students' work in relation to the learning outcome:

| **Exemplary** | | **Satisfactory** | | **Emerging** | | **Not Demonstrated** | |
|---|---|---|---|---|---|---|---|
| # | % | # | % | # | % | # | % |
| 3 | 23 | 6 | 46 | 4 | 30 | | |

Characteristics of student work for each category:

Exemplary:

"Exemplary" is achievement outstanding relative to the level necessary to meet course requirements. Assignments adhered to all the expectations and were completed with rigor and demonstrated growth over the course of the semester.

Satisfactory:

Represents achievement that meets the course requirement in every respect. Submitted coursework met the requirements, even if not always at a particularly high level of rigor or depth.

Emerging:

Achievement that is worthy of credit even though it fails to meet fully the course requirements. Submitted coursework met sufficient criteria to merit credit, even if sometimes falling short of the analytical expectations.

Practical significance of the results: In terms of meeting the "Intellectual and Practical Skills" requirement, the outcome of student work in this class falls in line with my experience in the past and in other courses. I found the range of achievement to be typical and appropriate: some students come better prepared than others, and I do not expect all students to achieve 'exemplary' status. However, I do find that students grew over the course of the semester. Some who began in the 'emerging' category put in substantial effort and demonstrated significant intellectual change over the course of the semester, this ending in the 'satisfactory' category. Given the complexity of this material, its definitions, and its social/political implications, I think the range of assignments and expected contributions worked well. In the future, I may consider further developing the collaborative piece, both among students themselves and with my own colleagues.