



**Fall 2017–Fall 2019 General Education Academic Assessment Results
February 9, 2020**

General Education Committee (2019–2020 AY)

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EXECUTIVE SUMMARY

SECTION A: BACKGROUND & HISTORY

THE LEAP MODEL OF GENERAL EDUCATION

General Education at Minot State University is based on AAC&U's LEAP initiative (<https://www.aacu.org/leap>). The LEAP initiative is built around a set of “essential learning outcomes” designed to instill a common set of *academic skills and capacities*, encourage *personal and social responsibility*, and promote an understanding of the *interconnecting perspectives* that shape current domestic and global issues. The overarching goal is to impart and develop skills that allow graduates to flourish and make life-long contributions to their professional, civic, and social world regardless of discipline, major, or career path. Minot State's model divides a student's General Education in to three broad **Developmental** categories: **critical capacities and skills (CCS)**, **personal and social responsibility (PSR)**, and **interconnecting perspectives (IP)**. These major developmental categories are further subdivided and detailed below. Students must take courses or engage in experiences from each subcategory during the course of their college career.

Critical Capacities and Skills (CCS) requires a student to demonstrate the capacity to think critically, write, collaborate, communicate, solve problems, and to deploy skills related to information and quantitative literacy. The sub-categories include: CCS1 Problem Solving, CCS2 Information Literacy, CCS3 Critical Reading, CCS4 Quantitative Literacy, CCS5 Oral/Written Communications, and CCS6 Collaboration.

Personal and Social Responsibility (PSR) requires a student to develop an understanding and commitment to individual well-being and to civic life and community needs. The sub-categories include: PSR1 Relationships and Value Systems, PSR2 Responding to Community Needs, and PSR3 Individual Well-Being.

Interconnecting Perspectives (IP) requires a student to study, reflect, and apply the understanding of diverse global and domestic perspectives both in the classroom and in a global setting. The sub-categories include: IP1 Knowledge and IP2 Experience.

Students fulfill developmental content requirements by taking courses approved for each of the specific CCS, PSR, and IP areas (11 total) listed above. Students fulfill many of these requirements using courses traditionally taken in the first or second year, but because both lower and upper division courses are included, in practice, meeting all of these requirements can be spread across the entire undergraduate career and can include courses in a student's major. The learning outcomes of each of the 11 developmental areas are assessed using rubrics adapted from AAC&U's LEAP rubrics.

THE NORTH DAKOTA UNIVERSITY SYSTEM GENERAL EDUCATION REQUIREMENTS

The North Dakota State Board of Higher Education has mandated that all students completing a Bachelor of Arts or Bachelor of Science degree within the North Dakota University System (NDUS) must complete the following General Education requirements (<https://ndus.edu/wp-content/uploads/sites/6/2018/09/gerta-guide-2018.pdf>):

| General Education Area | Minimum Required Lower Division Semester Hours |
|------------------------|--|
| Communications | 9 |
| Arts & Humanities | 6 |
| Social Sciences | 6 |

| | |
|--|-----------|
| Mathematics, Science & Technology | 9 |
| Institutional Specific (chosen from the above 4 areas) | 6 |
| Total | 36 |

Minot State has chosen to address these state requirements by dividing them into two categories: **Core requirements (Core)** and **Foundational Content (FC)**. The Core requirements include English 110 (3 cr), English 120 (3 cr), Communications 110 (3 cr) and a Mathematics course (3-4 cr). This core fulfills the state required 9 semester hours of communications requirements and 3 of the 9 required semester hours of Mathematics, Science and Technology. In addition, Minot State requires a two to three credit first year experience (UNIV 110). The remainder of the state requirements are distributed among the subcategories of Foundational Content as follows:

- **FC1**(6 cr) Arts & Humanities – Students will demonstrate knowledge of human cultures and cultural products—the arts and letters—and of how to study, compare, and critique diverse cultural perspectives and aesthetics. Students will also have the opportunity to produce their own cultural artifacts.
- **FC2** (8 cr) Lab Science – Students will demonstrate knowledge of the physical and natural world and how to produce and apply that knowledge in a variety of settings.
- **FC3** History (3 cr) and Social Sciences (6 cr)– Students will demonstrate knowledge of common and diverse historical experiences and of how to apply historical synthesis to inform decisions and understanding of the contemporary world. Courses from the social sciences in particular should emphasize scientific analysis from the everyday world and should analyze data and problems as they relate to the contemporary world. Courses from the social sciences in particular should emphasis analysis from the everyday world and should analyze data and problems as they relate to the contemporary world.

Although the NDUS does not require assessment of the general education requirements Minot State University has chosen to assess **Core** and **Foundational Content** courses by incorporating them into one or more of the **Developmental** categories (CCS, PSR or IP).

The MSU Academic Assessment Committee was charged with creating an assessment system designed to collect data from each of the courses or experiences assigned to one of the **Developmental Content** areas. Beginning in Fall 2017 Developmental Content courses or experiences were assessed on a three-semester rotating basis, as follows:

- Semester 1 - CCS1, CCS4, PSR1, IP1, IP2
- Semester 2 - CCS2, CCS5, PSR2, IP1, IP2
- Semester 3 - CCS3, CCS6, PSR3, IP1, IP2

The university will have rotated twice through this assessment scheme by the end of this academic year (2109-2020).

The responsibility for data collection and analyses was turned over to the General Education Committee at the beginning of the 2019-2020 academic year.

SECTION B: METHODS AND LIMITATIONS

As the primary requirement for each general education course the course instructor was asked to identify and evaluate a single assignment or project that the students completed. This assignment was evaluated using a rubric (<https://www.minotstateu.edu/ge/pages/ge-applications.shtml>), adapted from the AAC&U's LEAP rubrics, common to each of the subcategories. The rubrics evaluate how well a student meet the subcategory's learning outcomes. Rubrics are based on a 4 point, Likert-type scale. During the course of a term instructors reported assessment result for each student, up to 30 students, to a central database.

The distribution of scores were reported by course instructors according to students' class status – freshman, sophomore, junior and senior. Given the ordinal nature of the data, analyses were carried out using non-parametric statistical tests. Distributions of scores within each class were analyzed by χ^2 -analysis which assumed scores within each class were distributed proportionally to the class' representation within total course sample population. The explicit hypotheses were:

- Null hypothesis - The actual distribution of scores within each class did not differ significantly ($\alpha=0.05$, $\beta=0.2$) from the assumed proportional distribution model because the course instruction had little to no impact on the students' learning outcomes.
- Alternative hypothesis #1 – The actual distribution of class scores was significantly higher than suggested by the proportionality model as a result of the instruction during the course.
- Alternative hypothesis #2 – The actual distribution of class scores was significantly lower than expected because the students failed to assimilate the lessons of the course.

In addition, the distribution of Freshman scores was compared to that of Senior scores using the non-parametric Mann-Whitney test to ascertain whether there was a significant improvement ($\alpha=0.05$, $\beta=0.2$) in scores between matriculation and graduation. The explicit hypotheses were:

- Null hypothesis – The distribution of scores between Freshmen and Seniors did not differ significantly ($\alpha=0.05$, $\beta=0.2$) because the course instruction had little to no impact on the students' learning outcomes.
- Alternative hypothesis #1 – The distribution of scores was significantly higher for Seniors than Freshman because exposure to similar course content in multiple courses during a Senior student's college career has resulted in greater assimilation of learning outcomes compared to the single exposure among Freshmen. There is an implicit assumption here that Seniors have had multiple exposures to each of General Education subcategories.
- Alternative hypothesis #2 - – The distribution of scores was significantly higher for Seniors than Freshman because undefined forces such maturity and greater life-experience has led Senior students to assimilate lessons similar to those taught during an instructional course.

Notes & Limitations:

- Student class status classified as "Other" were discarded from analyses.
- Dual credit high school students were classified as "Freshmen" for purposes of analyses.
- Analyses were limited by data being reported as scores for class status. There is an implicit assumption here that students will receive multiple exposures to each of the General Education subcategories during their college education. Thus, class status is assumed to be a proxy for the number of General Education exposures. However, what is truly of interest is not the class status of the student but how many times the student has been exposed to similar course material.

SECTION C: ASSESSMENT RESULTS

For all developmental content sub-categories the distribution of scores within each class were analyzed by χ^2 -analysis which assumed scores within each class were distributed proportionally to the class' representation within total course sample population. In addition, for all developmental content sub-categories, the distribution of Freshman scores was compared to that of Senior scores using the non-parametric Mann-Whitney test to ascertain whether there was a significant improvement ($\alpha=0.05$, $\beta=0.2$) in scores between matriculation and graduation.

Critical Capacities and Skills (CCS) 1: Problem Solving

Problem solving skills for 48 courses were evaluated in the fall of 2017 and spring 2019. The data were analyzed in aggregate.

Problem solving requires students to demonstrate the ability to raise vital questions and problems, formulating them clearly and precisely. To show this, students will demonstrate:

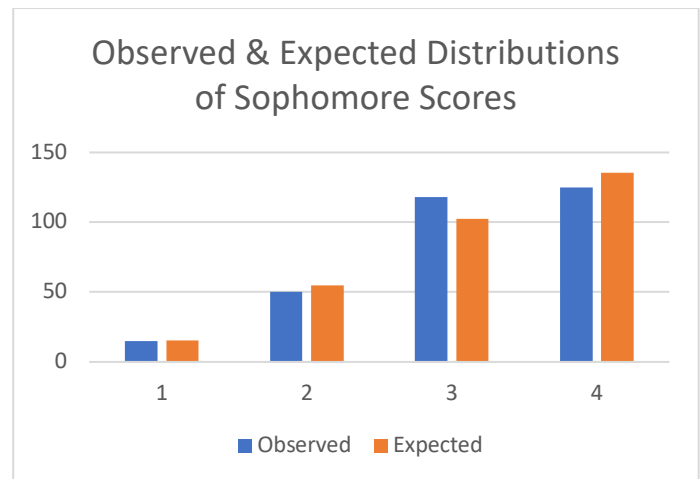
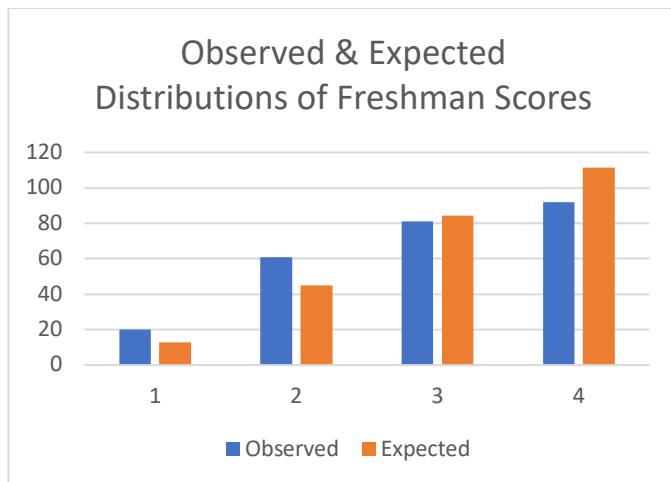
1. the ability to state a problem/question.
2. the ability to determine solutions associated with the problem/question.
3. the ability to evaluate evidence associated with the solutions.
4. the ability to select and defend the best solution for the problem/question.

For more information and to view the CCS1 rubric, please see

http://www.minotstateu.edu/ge/documents/ge_app/ccs_1.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

CCS1.1 Problem statement



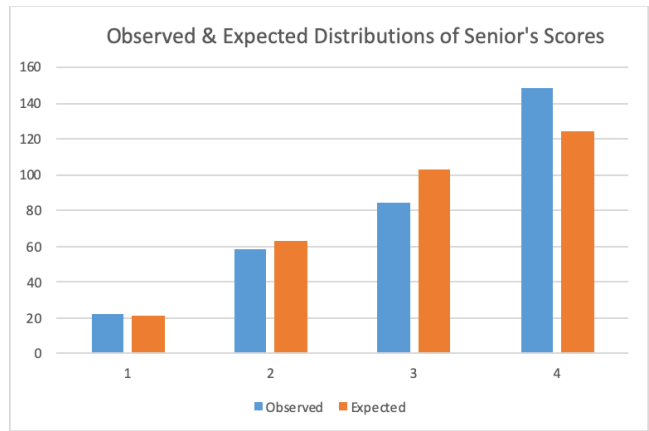
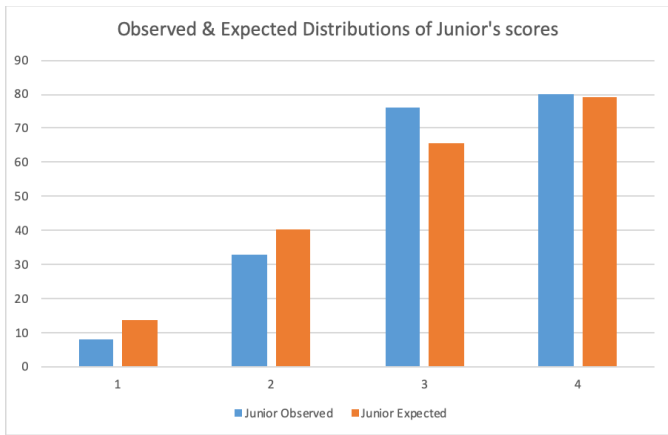


Figure 1.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.0043), B) Sophomores (0.31), C) Juniors (0.16), Seniors (0.23).

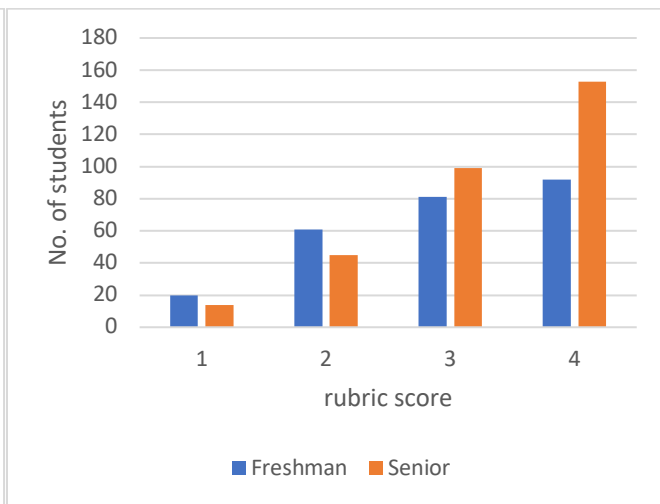
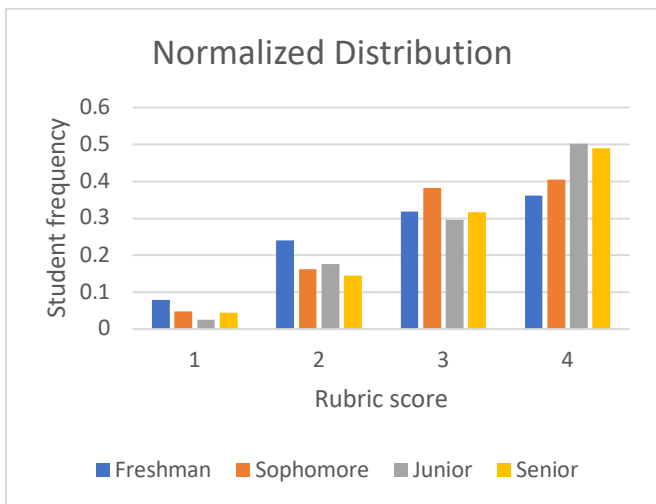
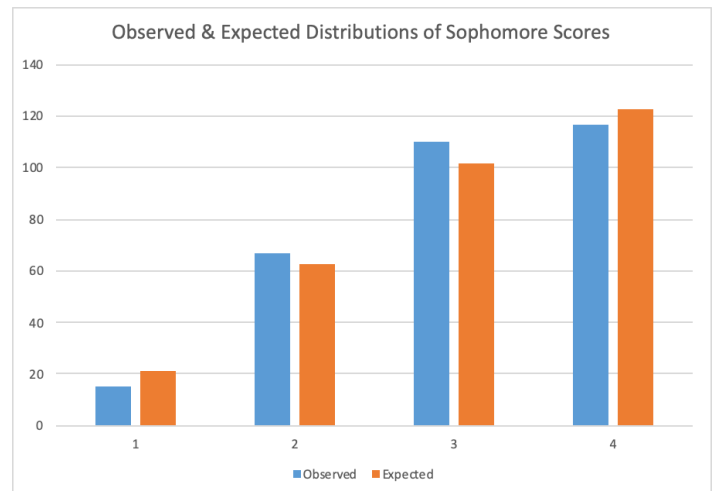
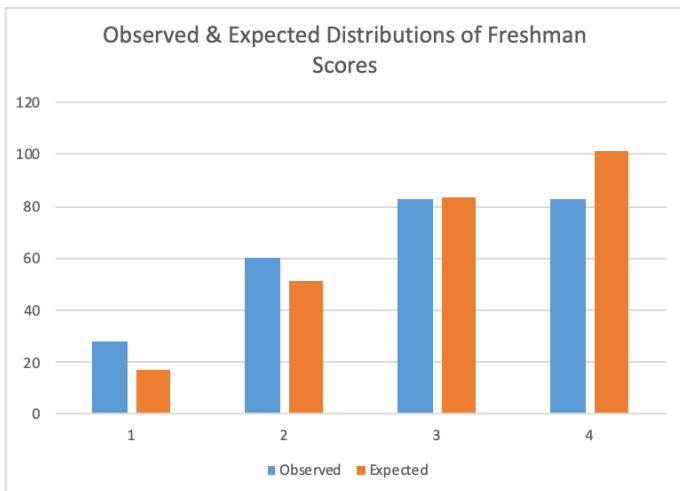


Figure 1.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.00019).

CCS1.2 Determination of Alternative Problem Solutions



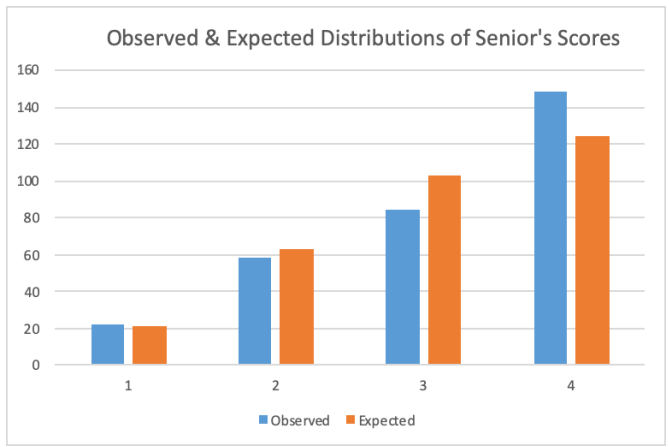
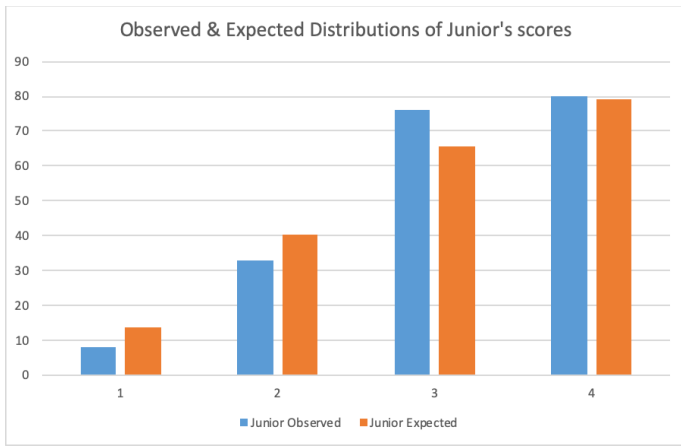


Figure 1.2.1 χ^2 Distributions by class status (p-values): A) Freshman (0.01), B) Sophomores (0.40), C) Juniors (0.15), Seniors (0.038).

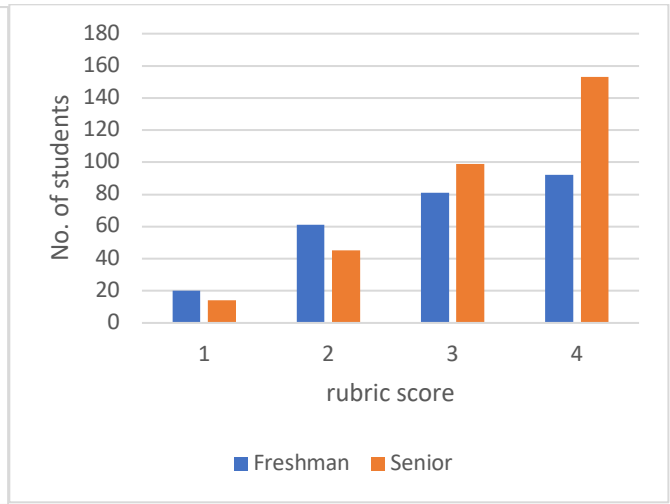
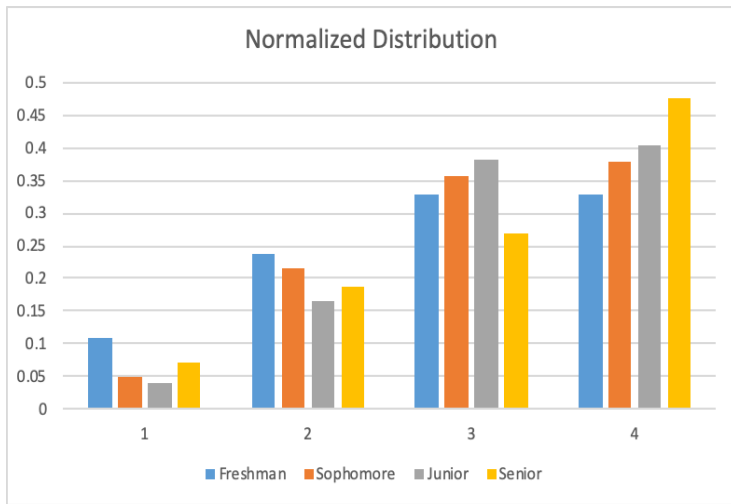
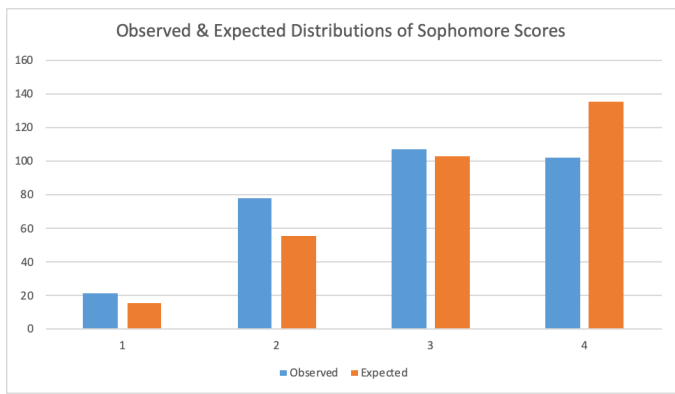
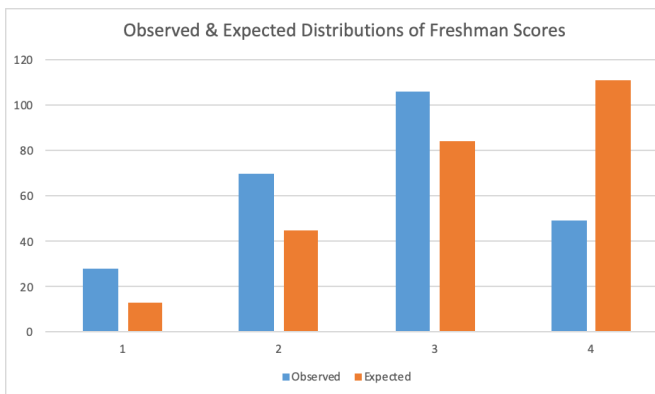


Figure 1.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.00050).

CCS1.3 Evaluation of Evidence



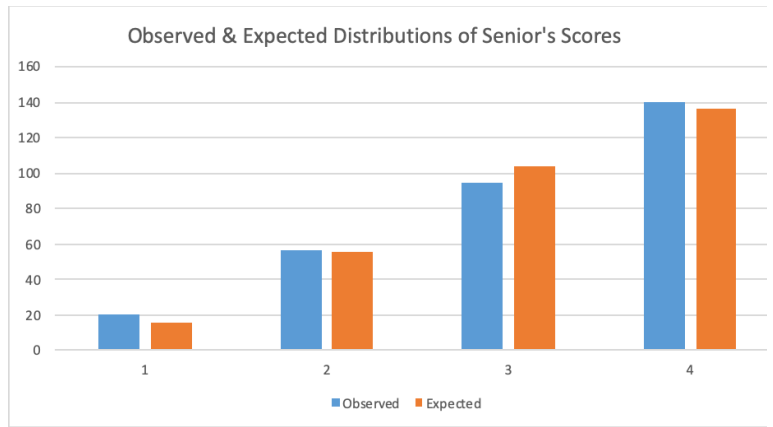
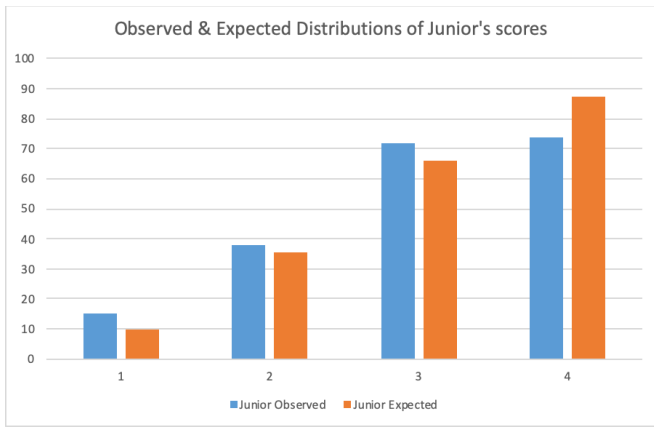


Figure 1.3.1 χ^2 Distributions by class status (p-values): A) Freshman (1.3×10^{-15}), B) Sophomores (0.00016), C) Juniors (0.16), Seniors (0.57).

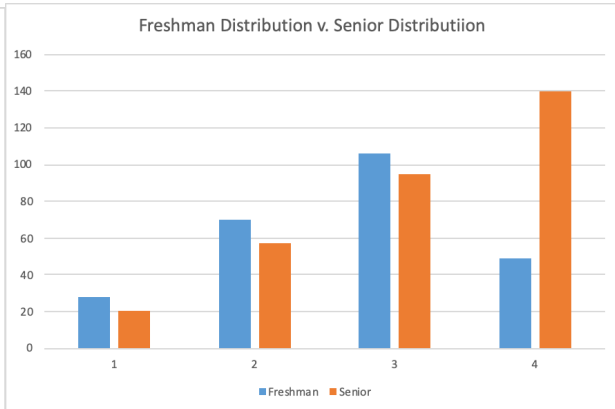
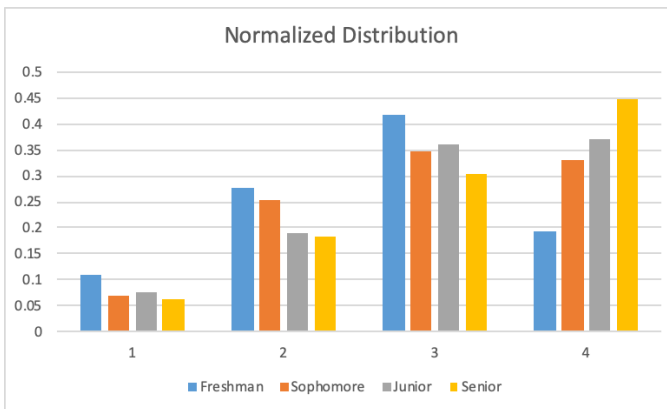
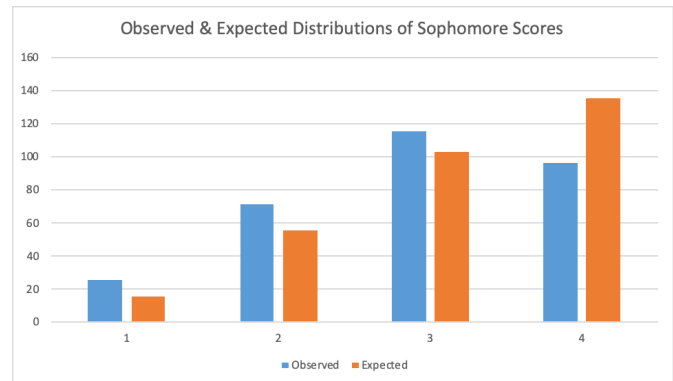
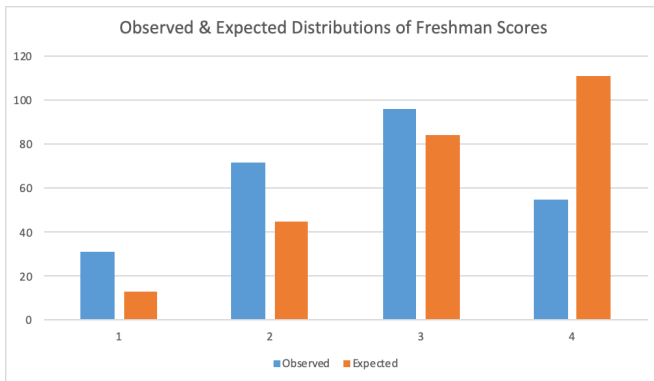


Figure 1.3.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 4.9×10^{-9}).

CCS1.4 Selection of Problem Solution



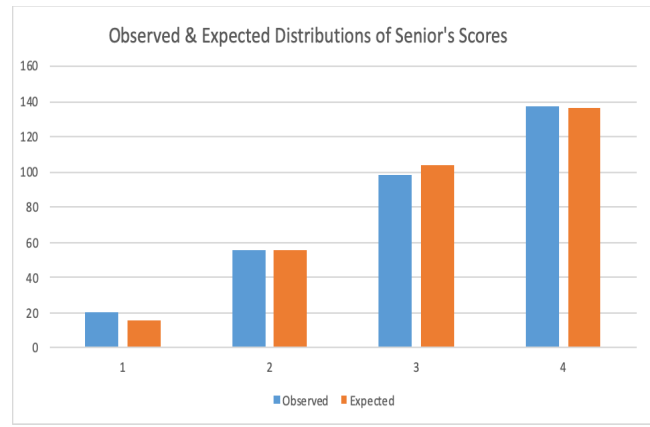
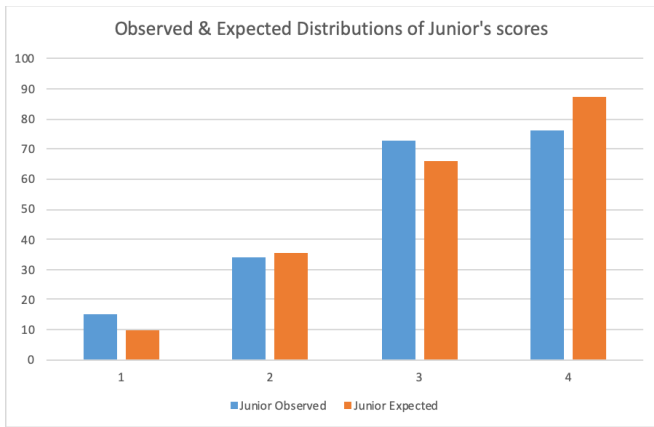


Figure 1.4.1 χ^2 Distributions by class status (p-values): A) Freshman (1.5×10^{-15}), B) Sophomores (3.2×10^{-5}), C) Juniors (0.19), Seniors (0.68).

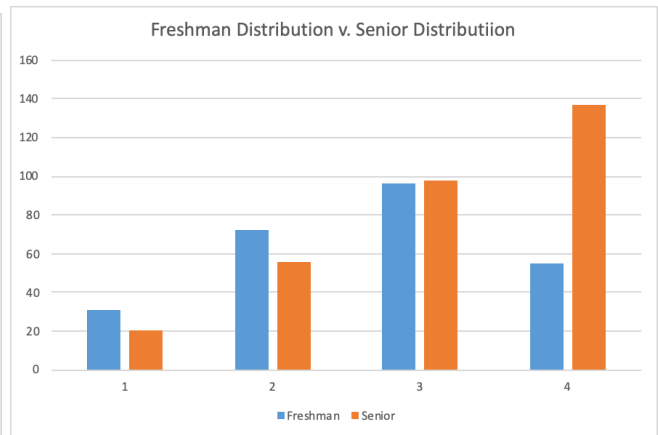
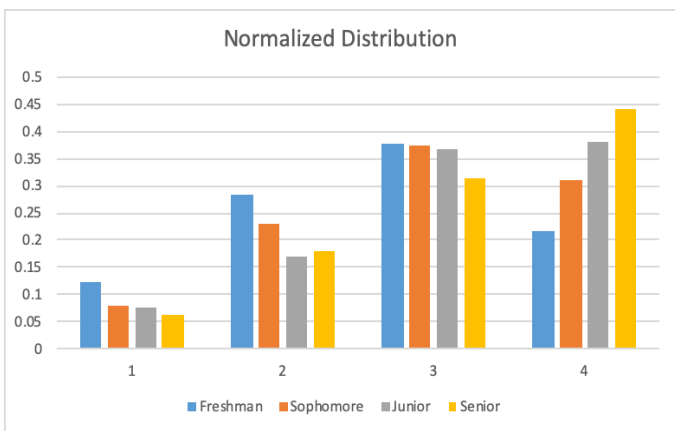


Figure 1.4.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.6×10^{-8}).

CRITICAL CAPACITIES AND SKILLS 2: INFORMATION LITERACY

Information Literacy for 35 courses were evaluated in the spring of 2018 and fall 2019. The data were analyzed in aggregate.

Information literacy requires students to demonstrate the ability to locate, evaluate, select and assess relevant information, use abstract ideas to interpret information effectively, and come to well-reasoned conclusions and solutions. Students will demonstrate:

1. the ability to determine the nature and extent of information needed.
2. the ability to access needed information effectively and efficiently.
3. the capacity to evaluate information and its sources critically.
4. individually, or as a member of a group, the ability to use information effectively in order to accomplish a planned objective.
5. the ethical and legal use of information.

For more information and to view the CCS2 rubric, please see

http://www.minotstateu.edu/ge/documents/ge_app/ccs_2.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

CCS2.1 Determine the nature and extent of information needed

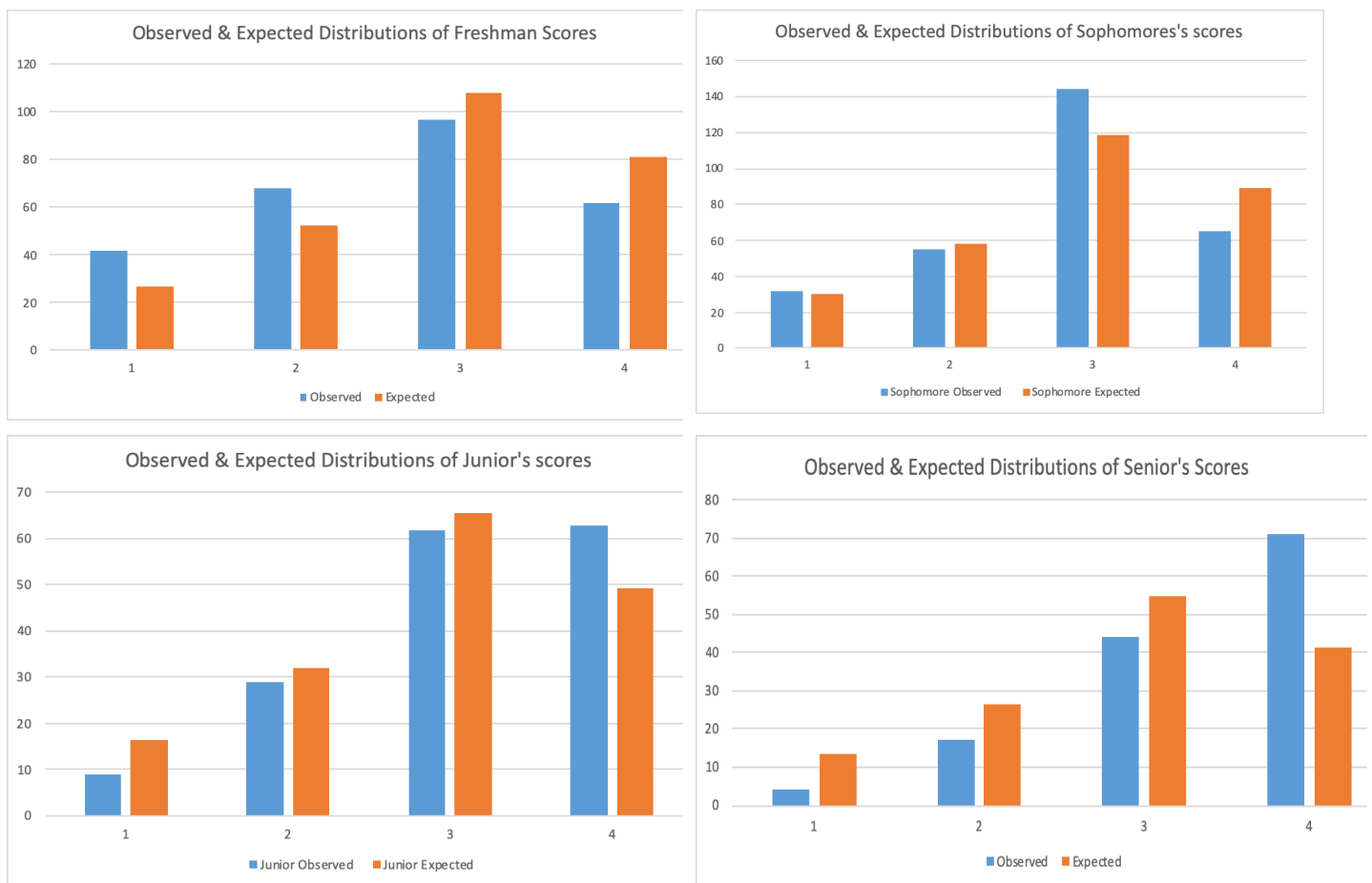


Figure 2.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.00036), B) Sophomores (0.0065), C) Juniors (0.054), Seniors (1.8×10^{-7}).

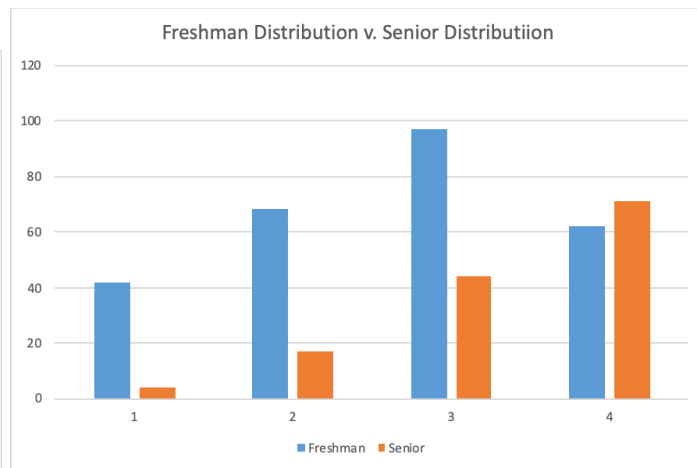
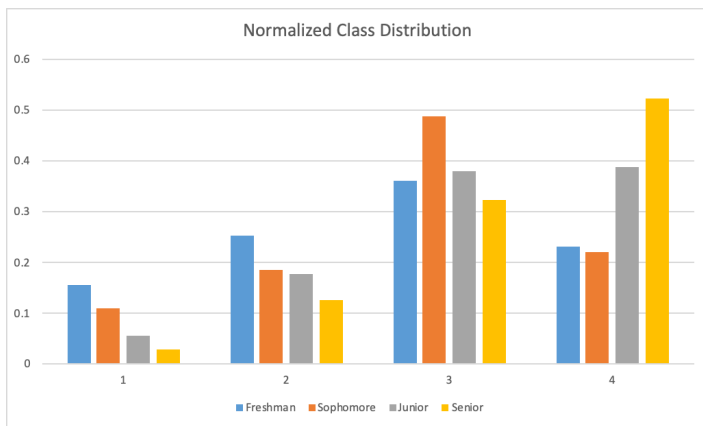


Figure 2.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 5.8×10^{-11}).

CCS2.2 Access Information

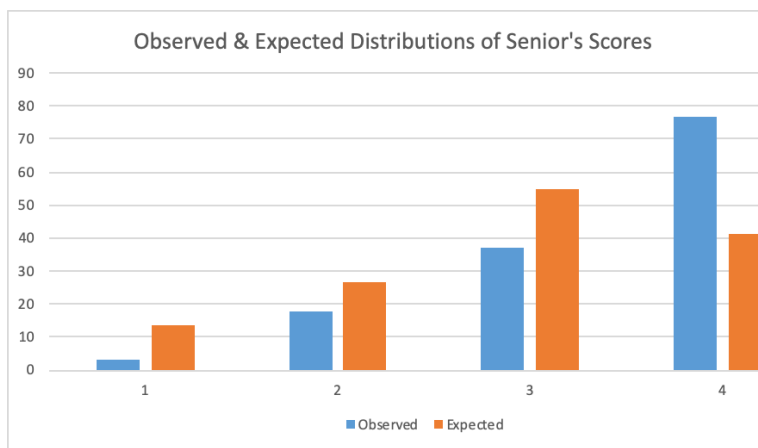
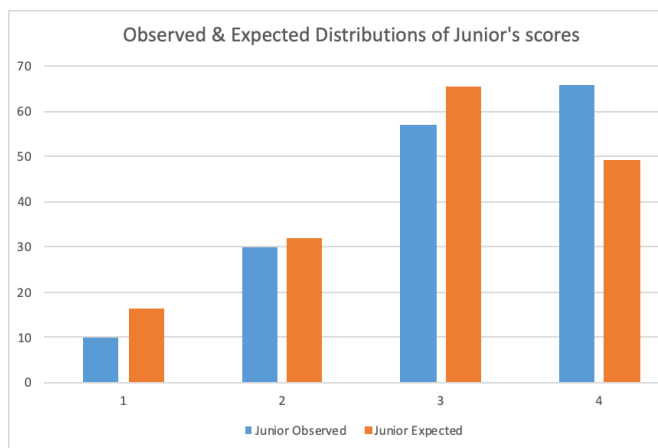
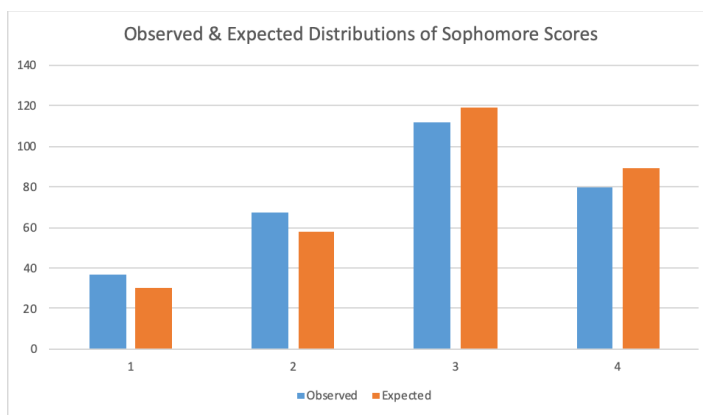
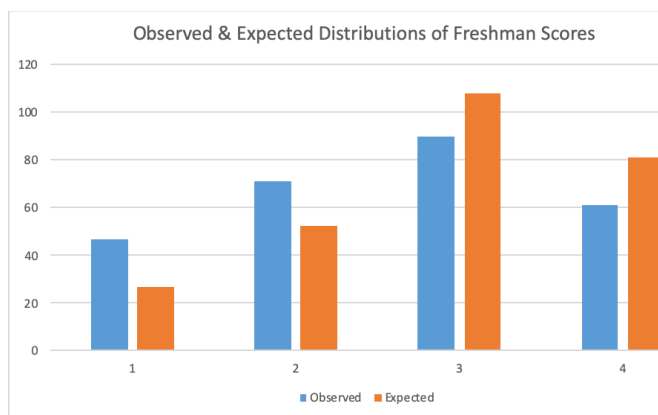


Figure 2.2.1 χ^2 Distributions by class status (p-values): A) Freshman (2.1×10^{-6}), B) Sophomores (0.21), C) Juniors (0.024), Seniors (1.9×10^{-10}).

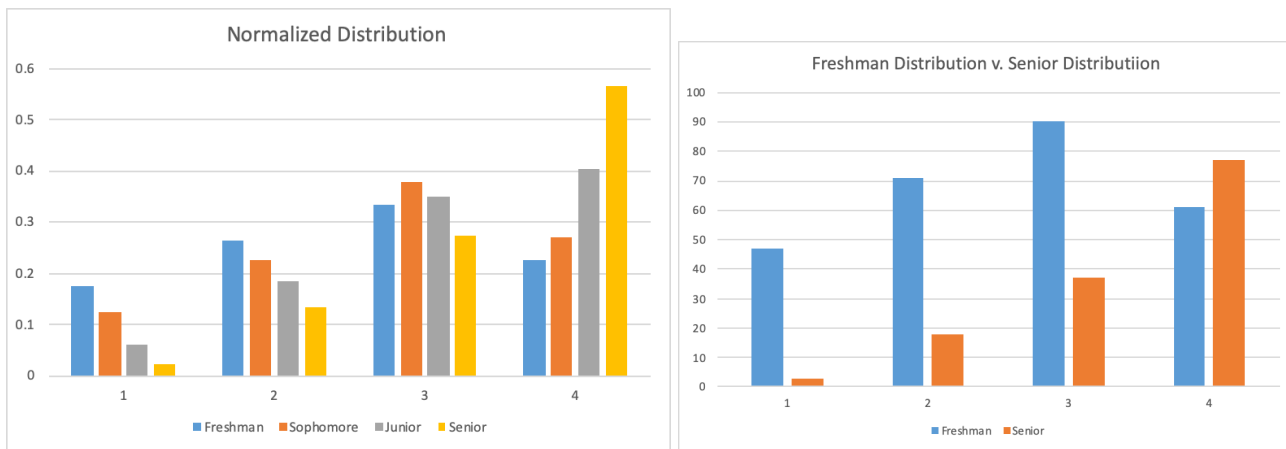


Figure 2.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.9×10^{-13}).

CCS2.3 Evaluation information and its sources critically

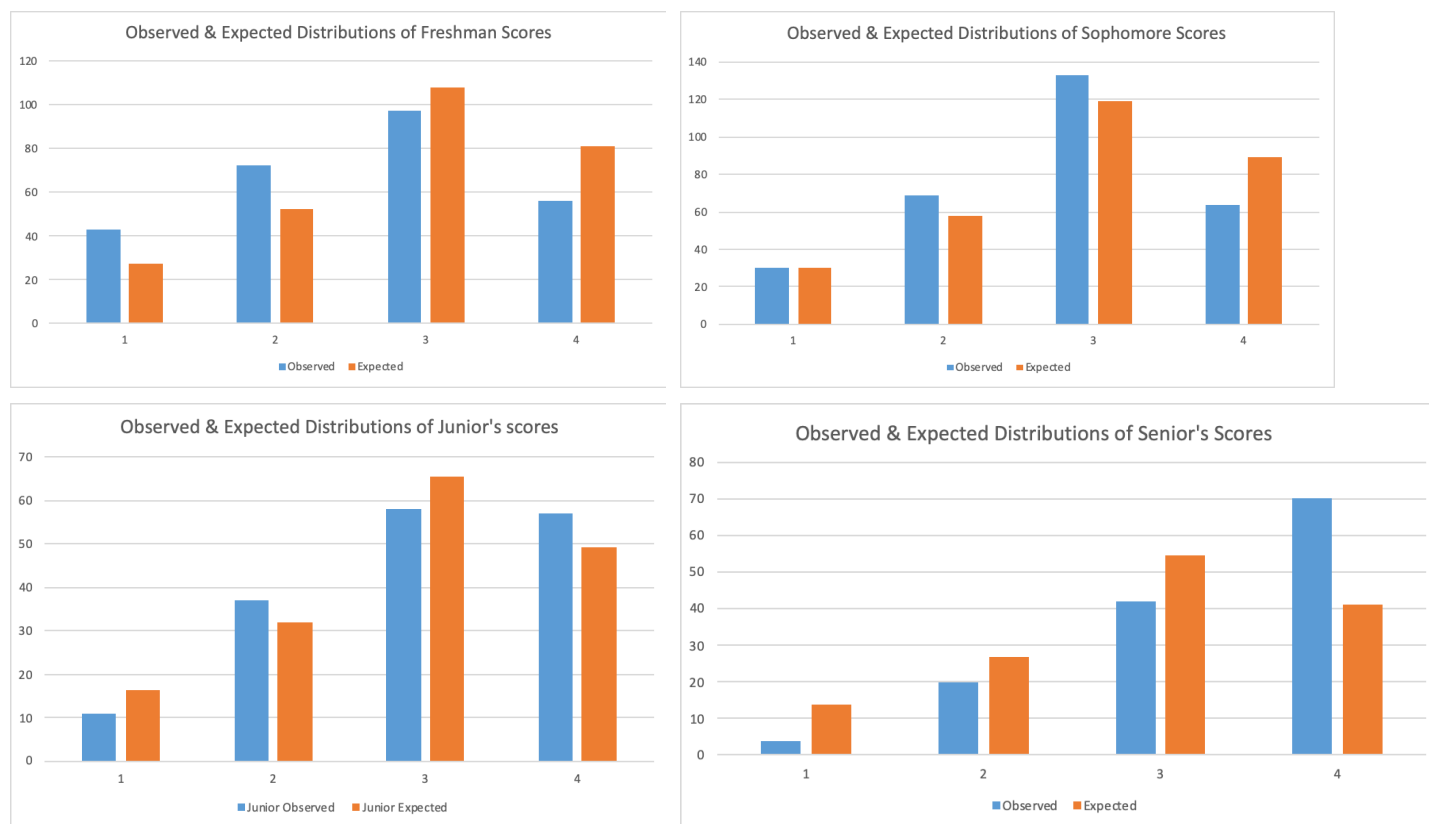


Figure 2.3.1 χ^2 Distributions by class status (p-values): A) Freshman (1.2×10^{-5}), B) Sophomores (0.012), C) Juniors (0.2), Seniors (5.8×10^{-7}).

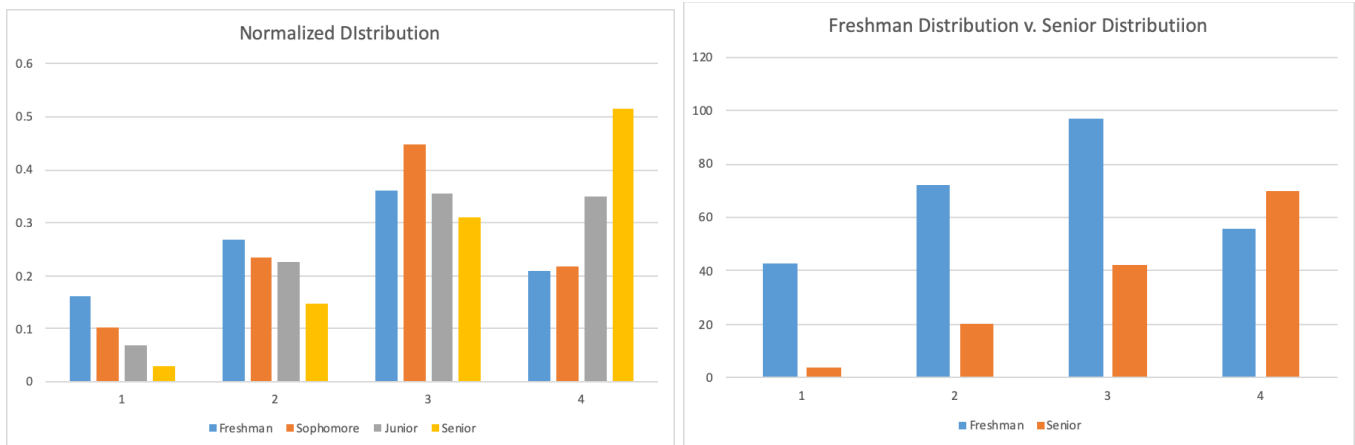


Figure 2.3.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 2.1×10^{-11}).

CCS2.4 Use information effectively to accomplish a planned objective

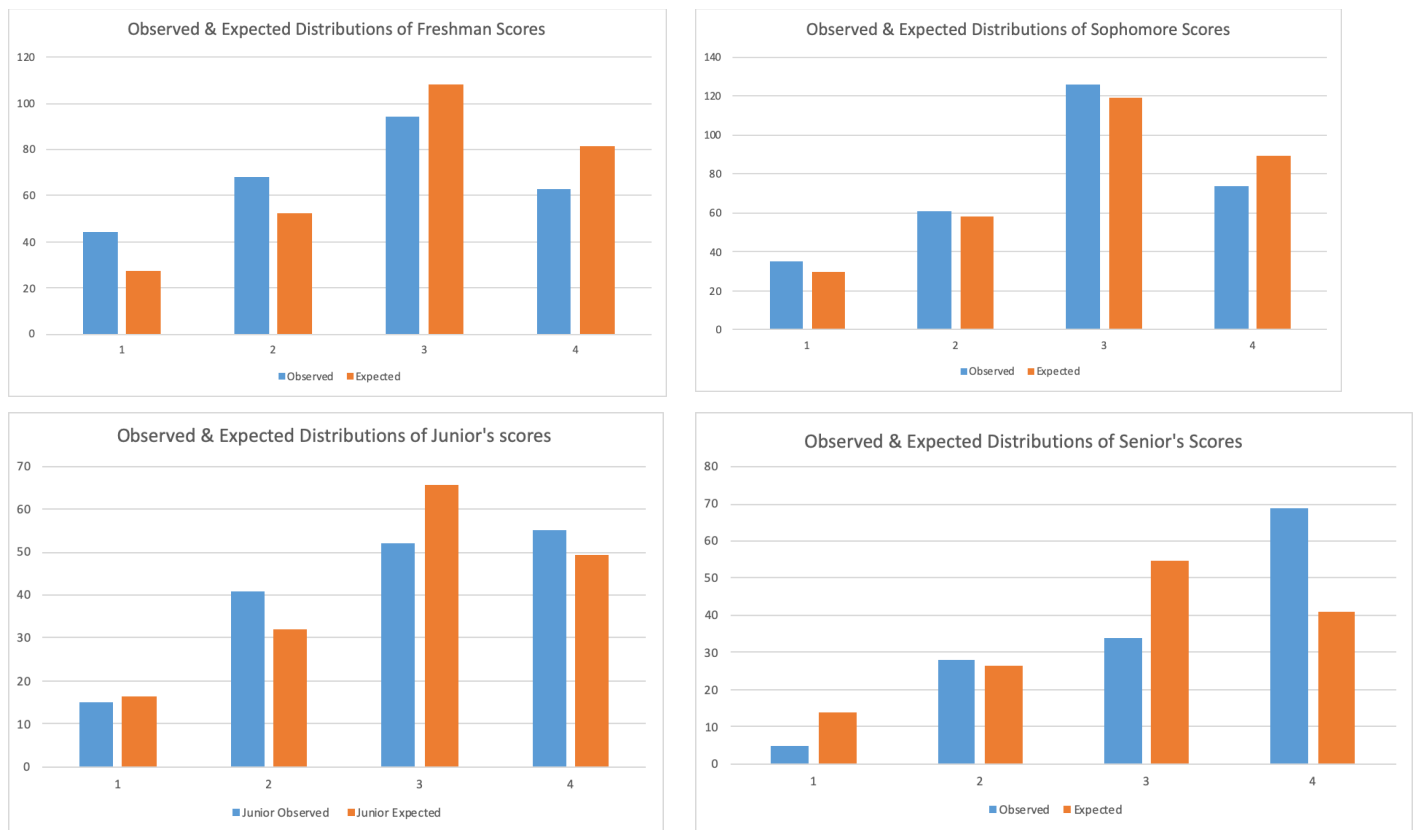


Figure 2.4.1 χ^2 Distributions by class status (p-values): A) Freshman (0.0001), B) Sophomores (0.25), C) Juniors (0.10), Seniors (4.4×10^{-7}).

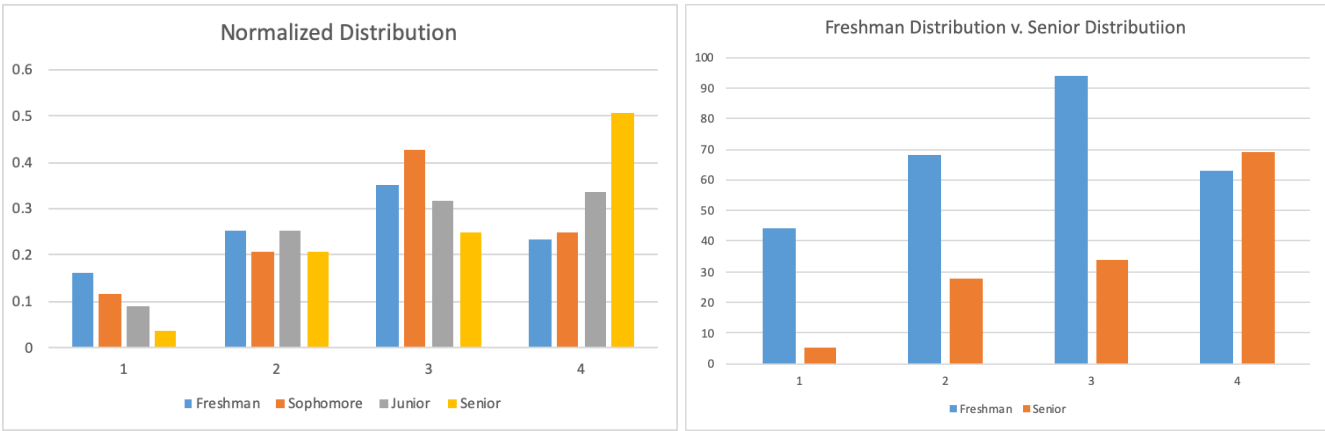


Figure 2.4.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 5.5×10^{-8}).

CCS2.5 Use information ethically and legally

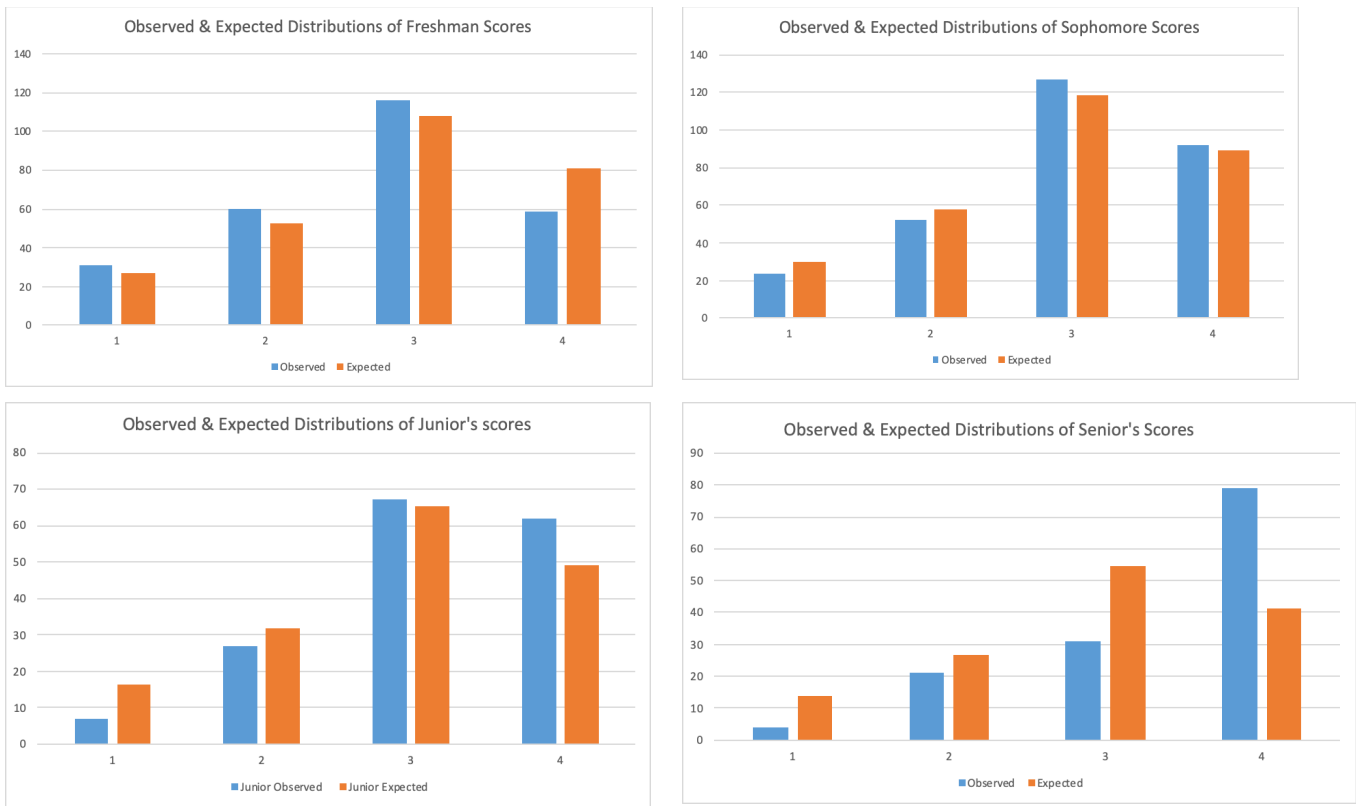


Figure 2.5.1 χ^2 Distributions by class status (p-values): A) Freshman (0.040), B) Sophomores (0.50), C) Juniors (0.023), Seniors (1.6×10^{-11}).

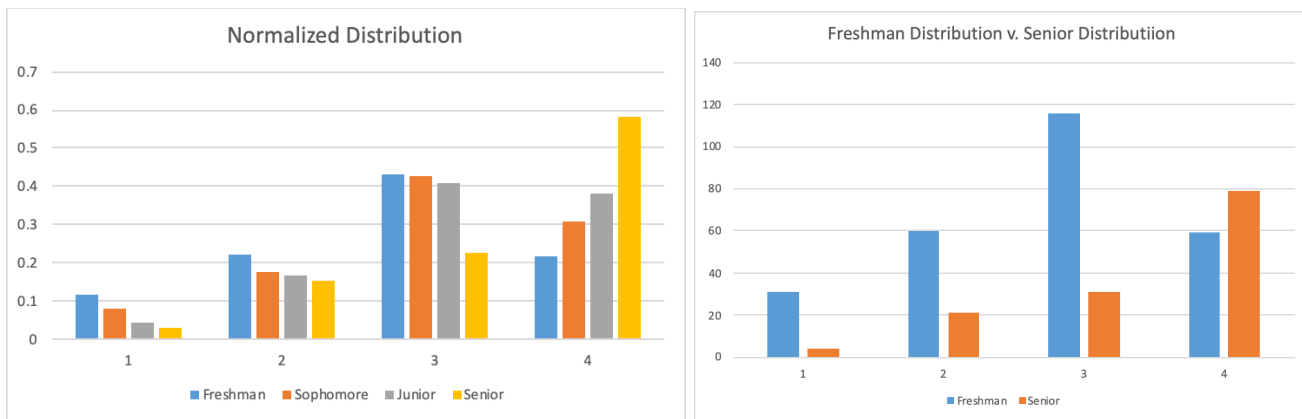


Figure 2.5.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.3×10^{-10}).

CRITICAL CAPACITIES AND SKILLS 3: CRITICAL READING

Critical Reading skills for 20 courses were evaluated in the fall of 2018.

Critical reading requires students to demonstrate the ability to think open-mindedly within alternative systems of thought, recognizing and assessing their assumptions, implications, and practical consequences. Students will demonstrate:

1. the ability to recognize possible implications of a text beyond the author's overt message.
2. the capacity to evaluate a text according to its scholarly contributions and consequences.
3. the ability to engage in reading as part of a continuing dialogue within and beyond a discipline or community of readers.
4. the capacity to discuss texts, verbally and in written form, with an independent intellectual perspective.

For more information and to view the CCS3 rubric, please see

http://www.minotstateu.edu/ge/documents/ge_app/ccs_3.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

CCS3.1 Contextualization

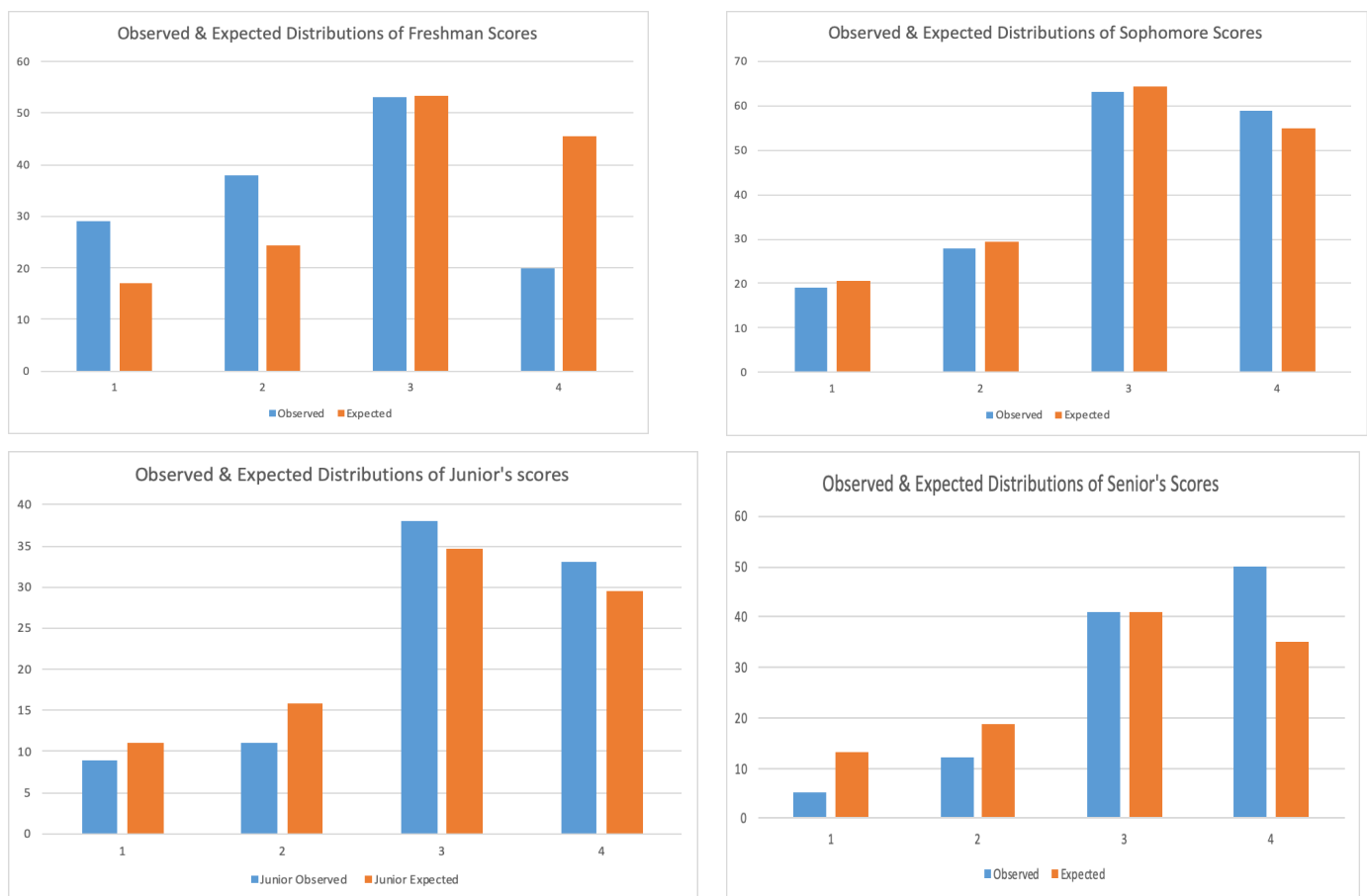


Figure 3.1.1 χ^2 Distributions by class status (p-values): A) Freshman (1.1×10^{-6}), B) Sophomores (0.91), C) Juniors (0.46), Seniors (0.003).

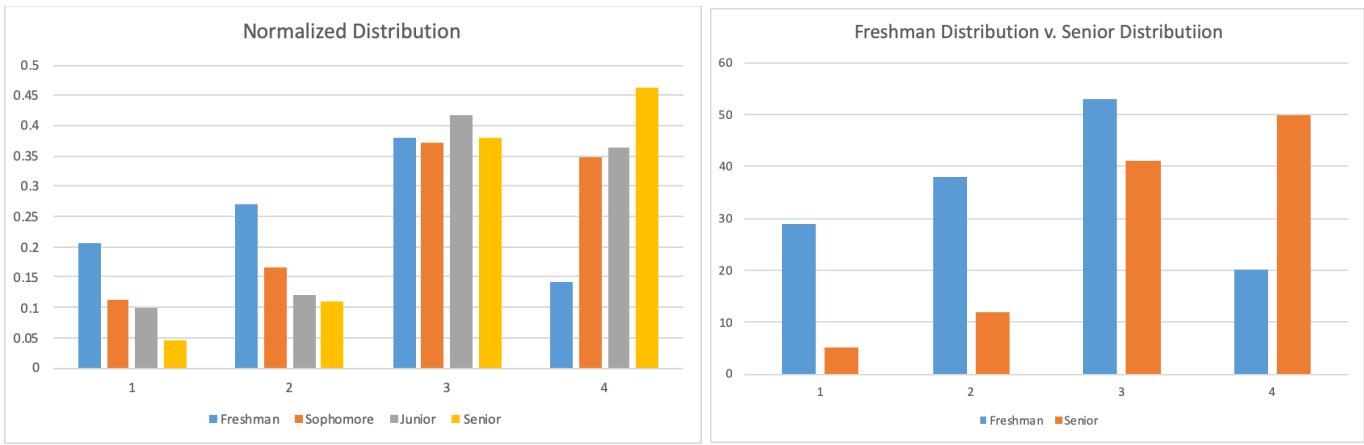


Figure 3.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.6×10^{-10}).

CCS3.2 Interpretation

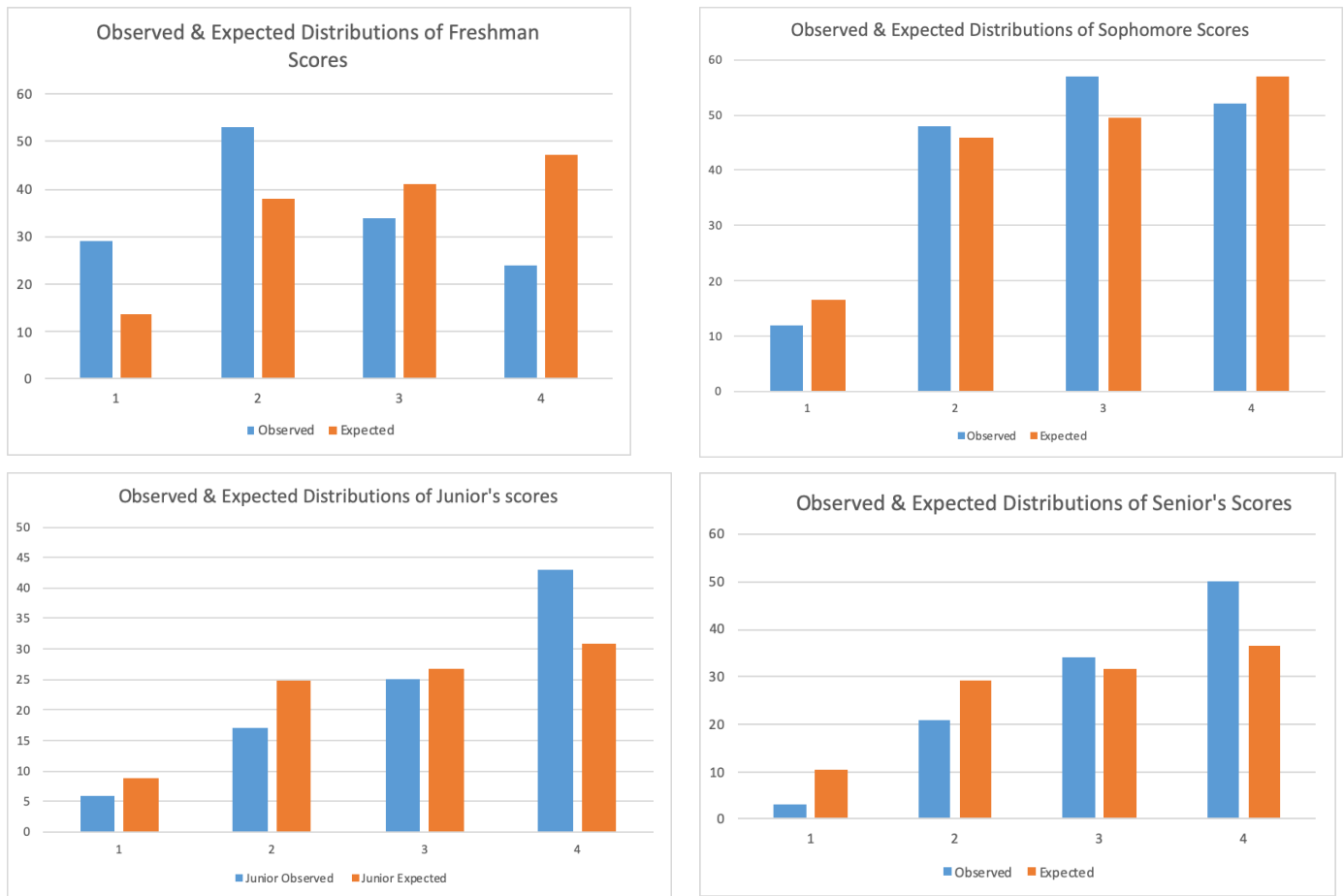


Figure 3.2.1 χ^2 Distributions by class status (p-values): A) Freshman (8.3×10^{-8}), B) Sophomores (0.41), C) Juniors (0.040), Seniors (0.005).

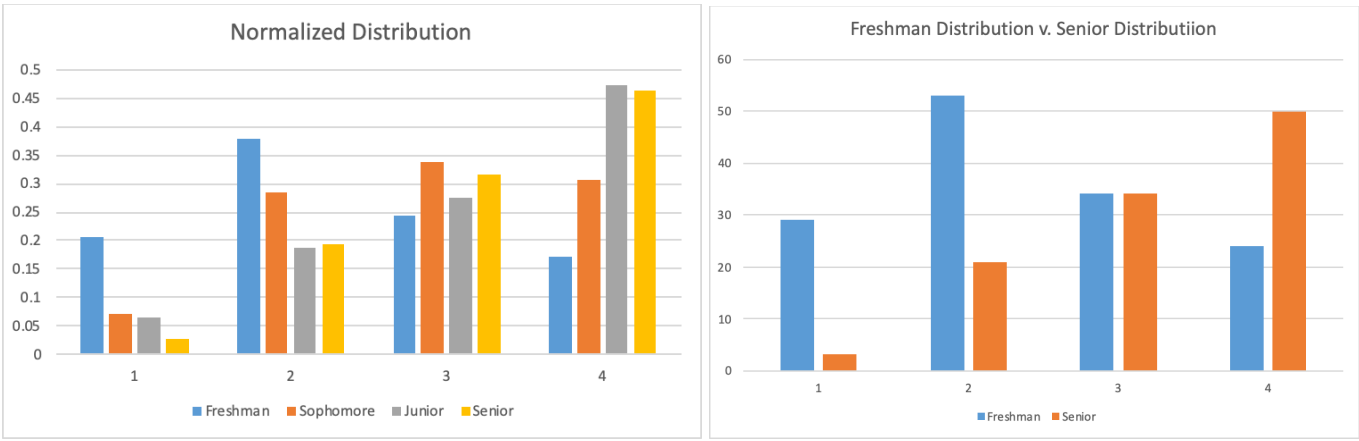


Figure 3.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 2.3×10^{-10}).

CCS3.3 Academic Discourse

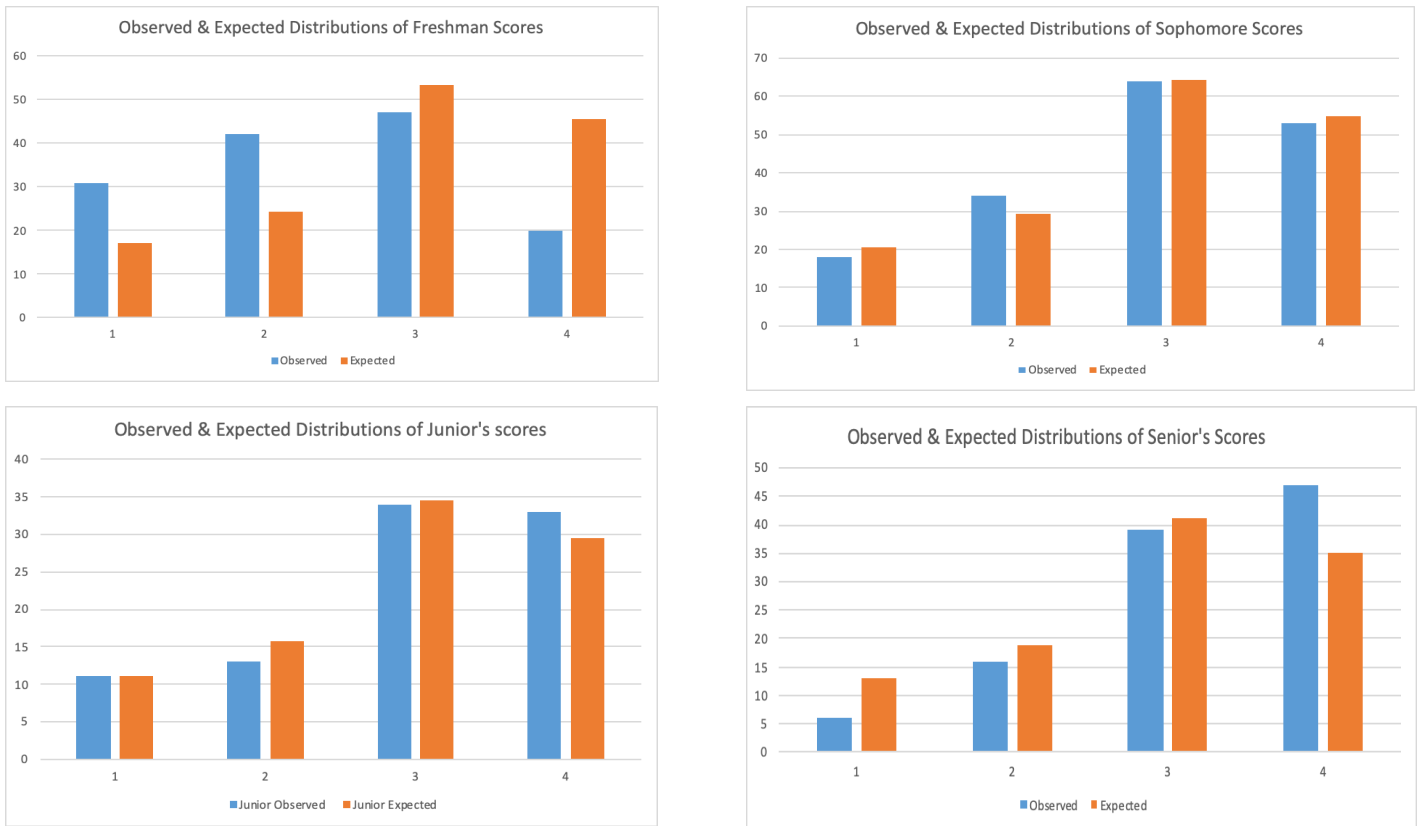


Figure 3.3.1 χ^2 Distributions by class status (p-values): A) Freshman (1.4×10^{-8}), B) Sophomores (0.78), C) Juniors (0.82), Seniors (0.038).

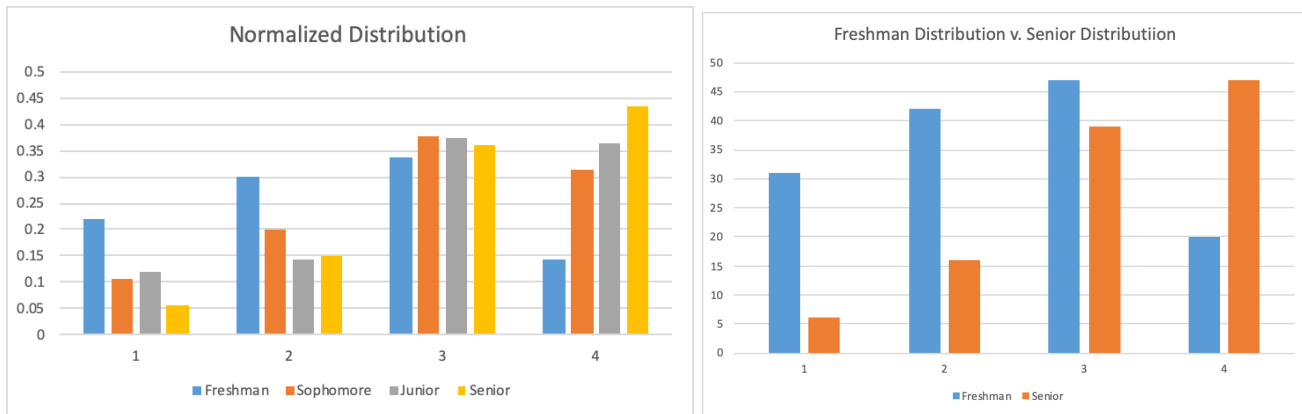


Figure 3.3.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.8×10^{-9}).

CRITICAL CAPACITIES AND SKILLS 4: QUANTITATIVE LITERACY

Quantitative Literacy was surveyed in 41 courses in the fall of 2017 and spring of 2019.

Quantitative literacy requires students to demonstrate the ability to think open-mindedly within alternative systems of thought, recognizing and assessing their assumptions, implications, and practical consequences. Students will demonstrate:

1. the ability to analyze and interpret quantitative information.
2. the capacity to critically analyze the limitations and bias of quantitative information.

For more information and to view the CCS4 rubric, please see http://www.minotstateu.edu/ge/documents/ge_app/ccs_4.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

CCS4.1 Interpretation

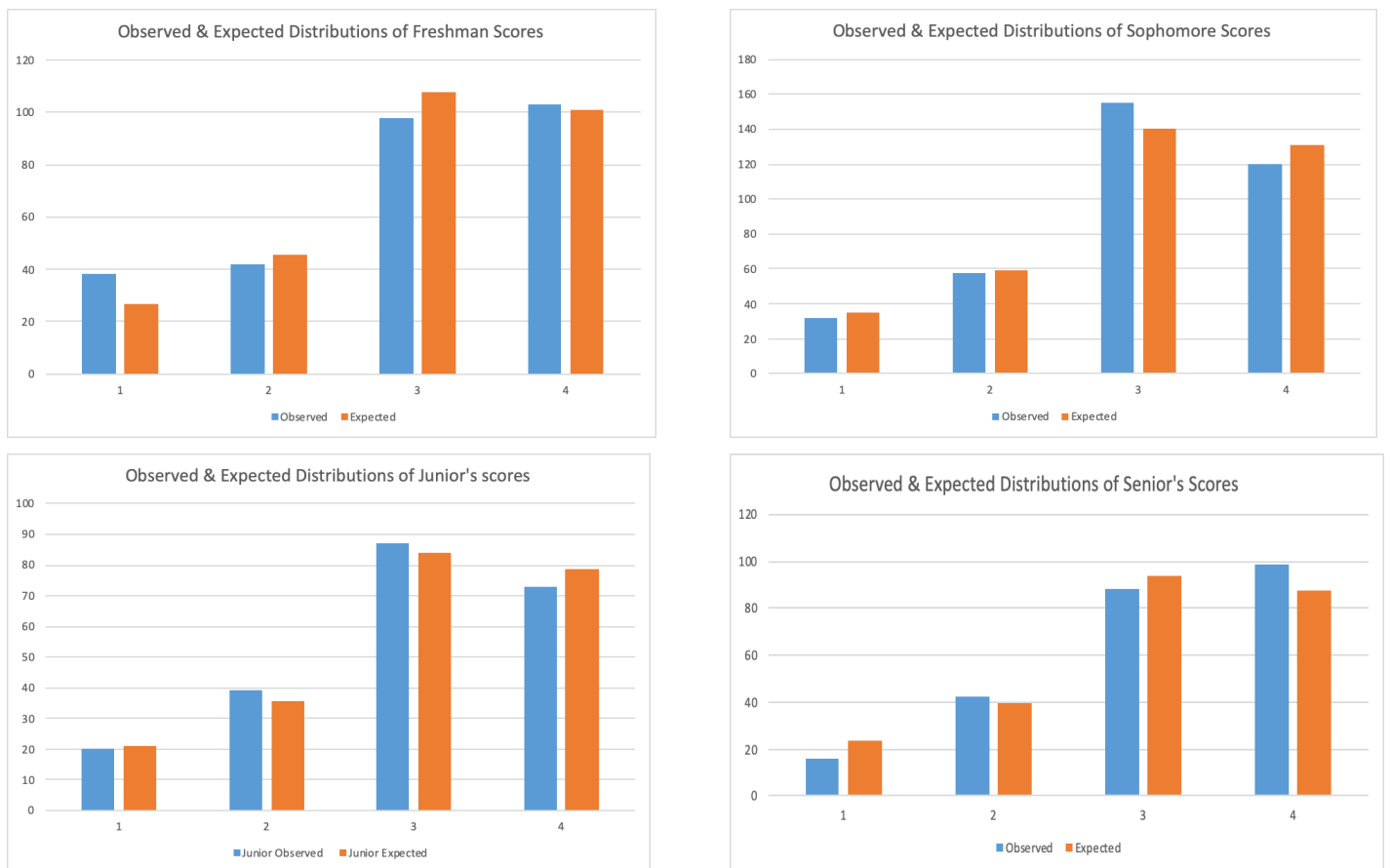


Figure 4.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.11), B) Sophomores (0.43), C) Juniors (0.83), Seniors (0.24).

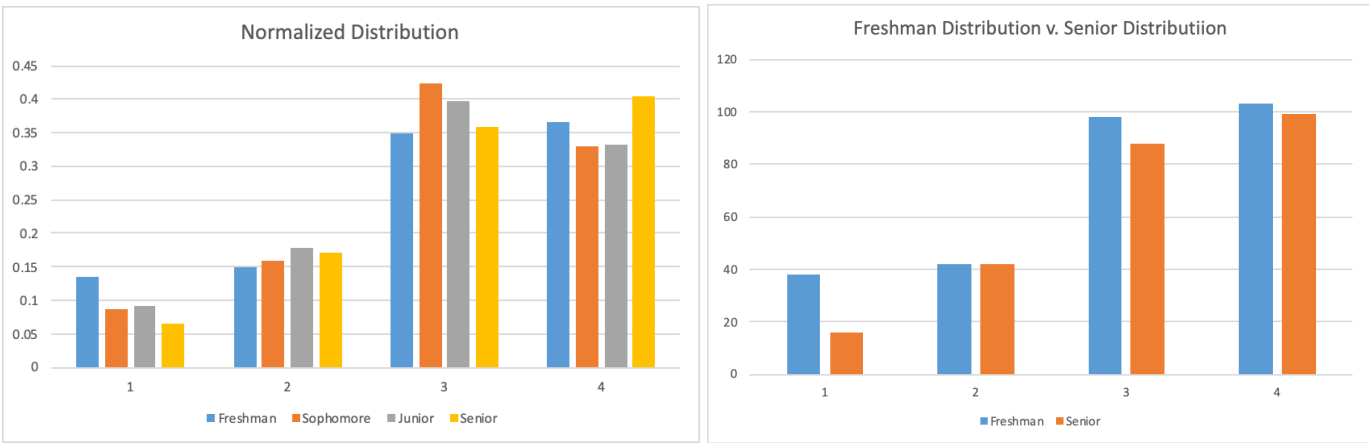


Figure 4.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.14).

CCS4.2 Application/Analysis

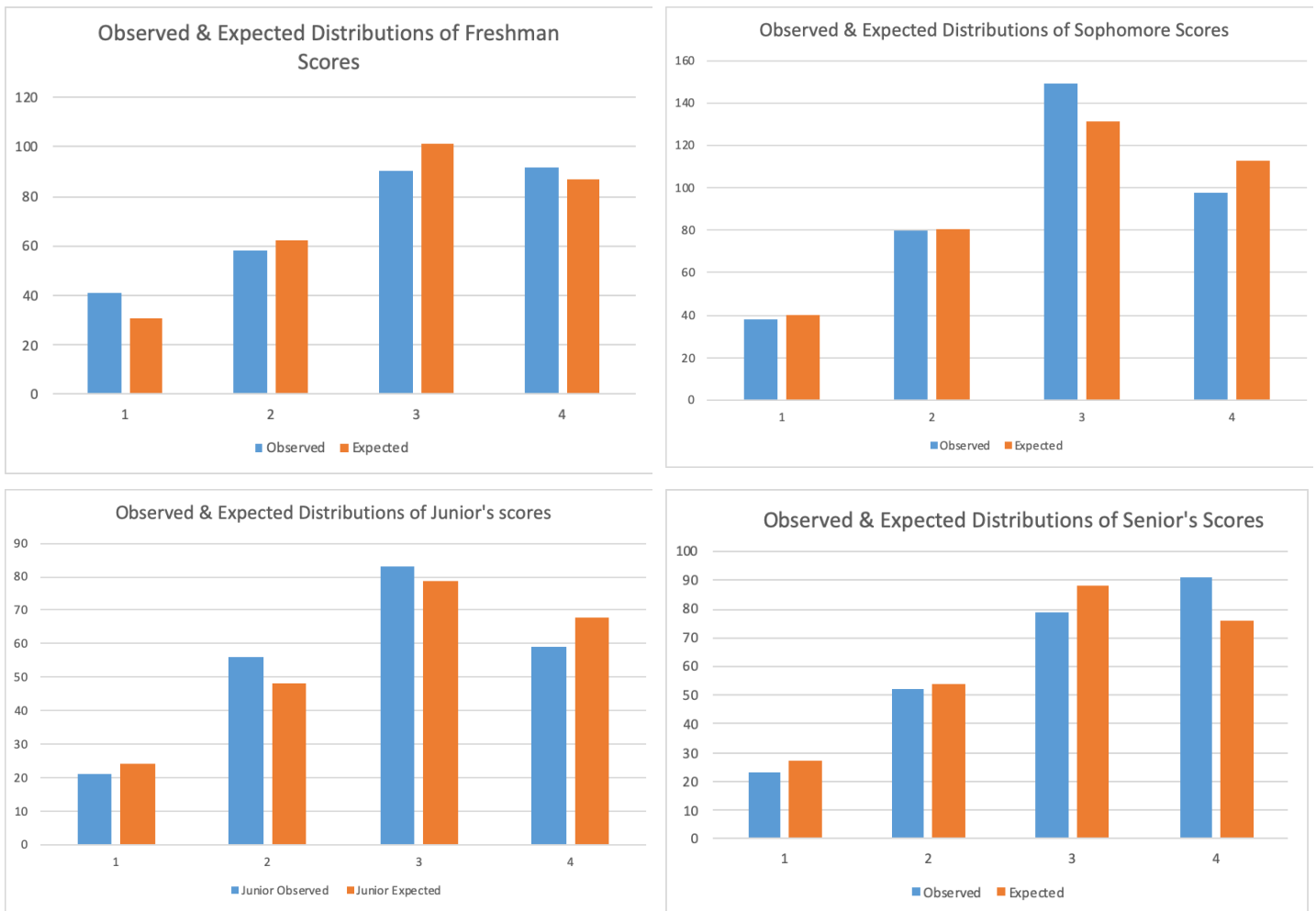


Figure 4.2.1 χ^2 Distributions by class status (p-values): A) Freshman (0.17), B) Sophomores (0.21), C) Juniors (0.39), Seniors (0.20).

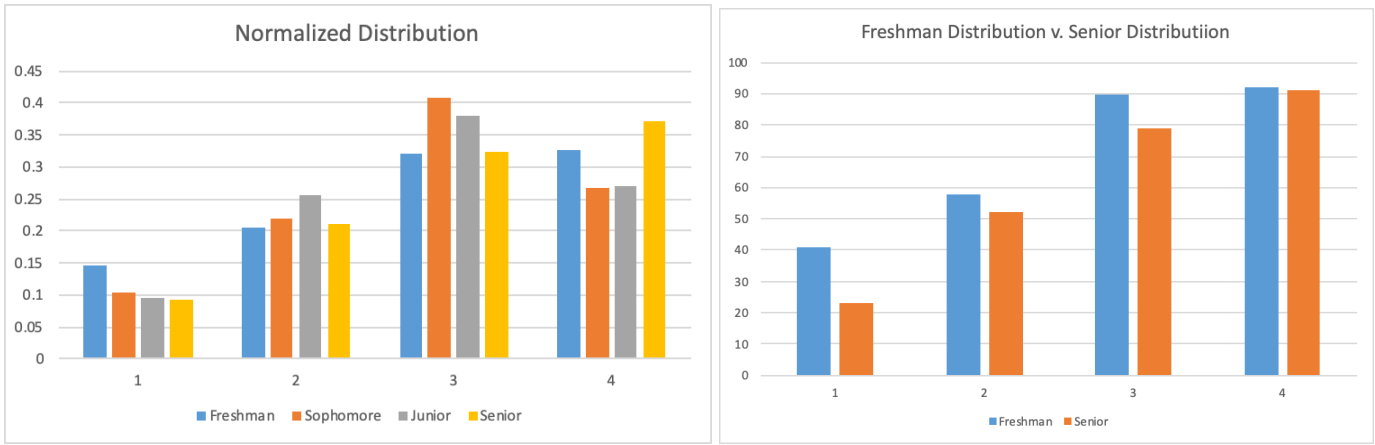


Figure 4.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.14).

Critical Capacities and Skills 5: Oral/Written Communications

Skills in Oral and Written Communications were surveyed in the spring of 2018 and fall of 2019 in 44 courses. Oral/written communication requires students to demonstrate the ability to communicate effectively with others when figuring out solutions to complex problems. Students will demonstrate:

1. competent content development and organization.
2. the appropriate use of sources and evidence.
3. the use of syntax, grammar, and delivery appropriate for discipline and audience.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

CCS5.1 Targeting

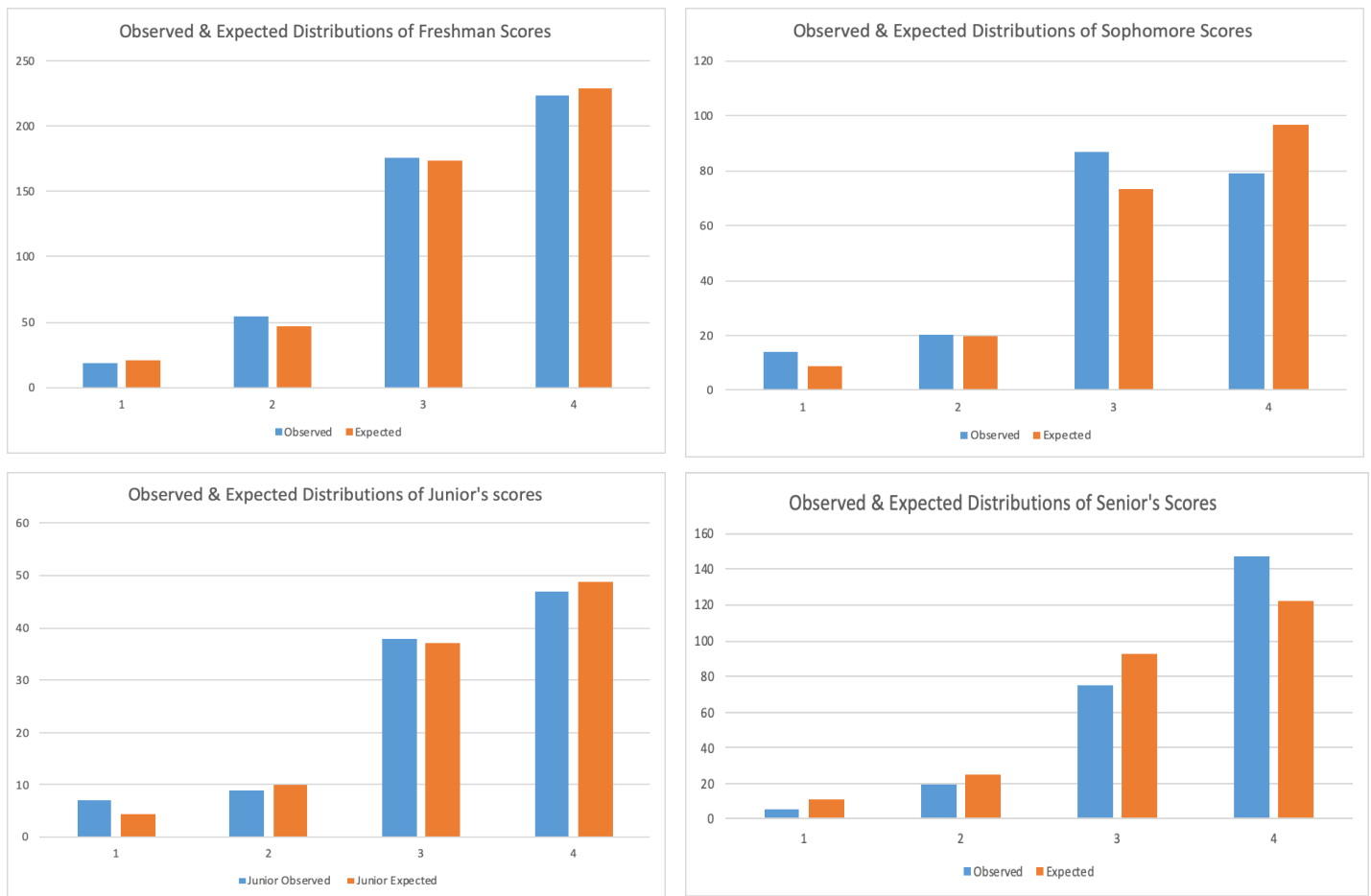


Figure 5.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.72), B) Sophomores (0.030), C) Juniors (0.64), Seniors (0.004).

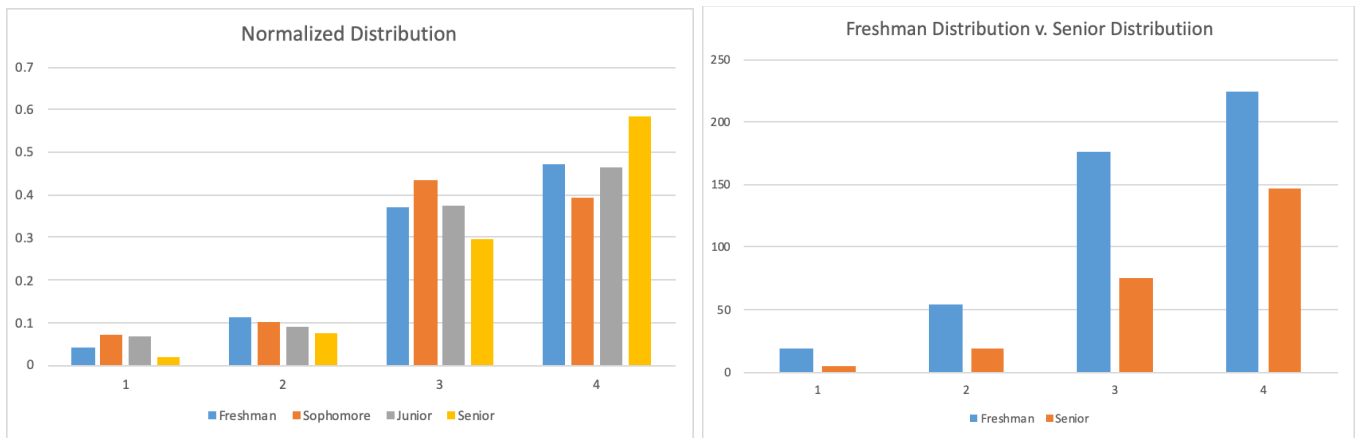


Figure 5.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.001).

CCS5.2 Content Development and Organization

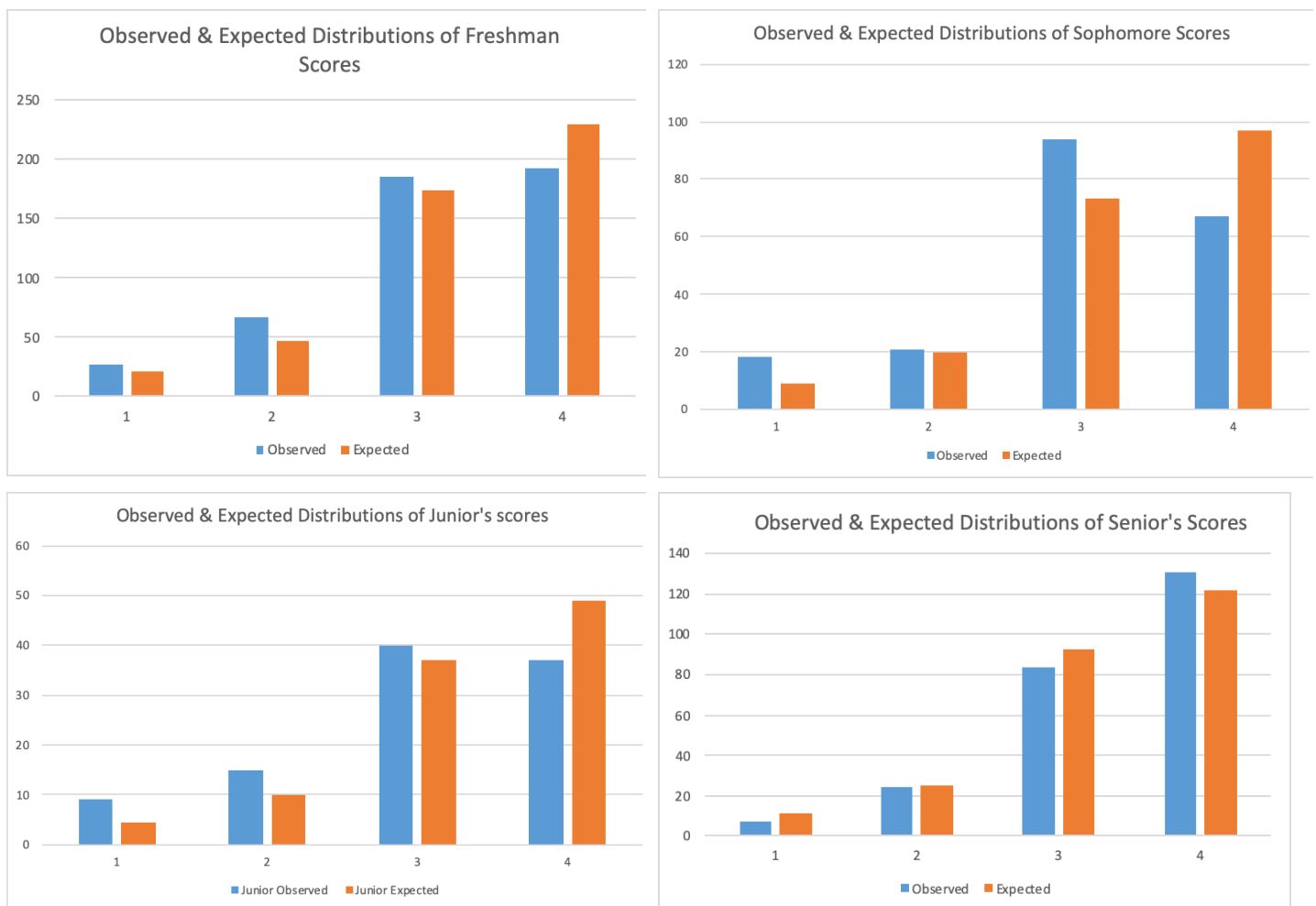


Figure 5.2.1 χ^2 Distributions by class status (p-values): A) Freshman (0.00071), B) Sophomores (1.7×10^{-5}), C) Juniors (0.016), Seniors (0.40).

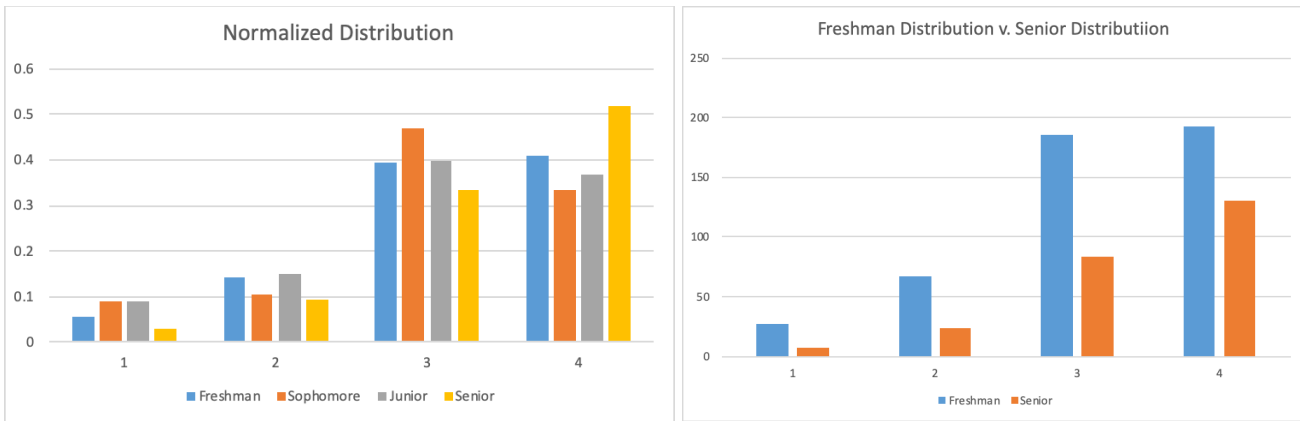


Figure 5.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.00058).

CCS5.3 Sources and Evidence

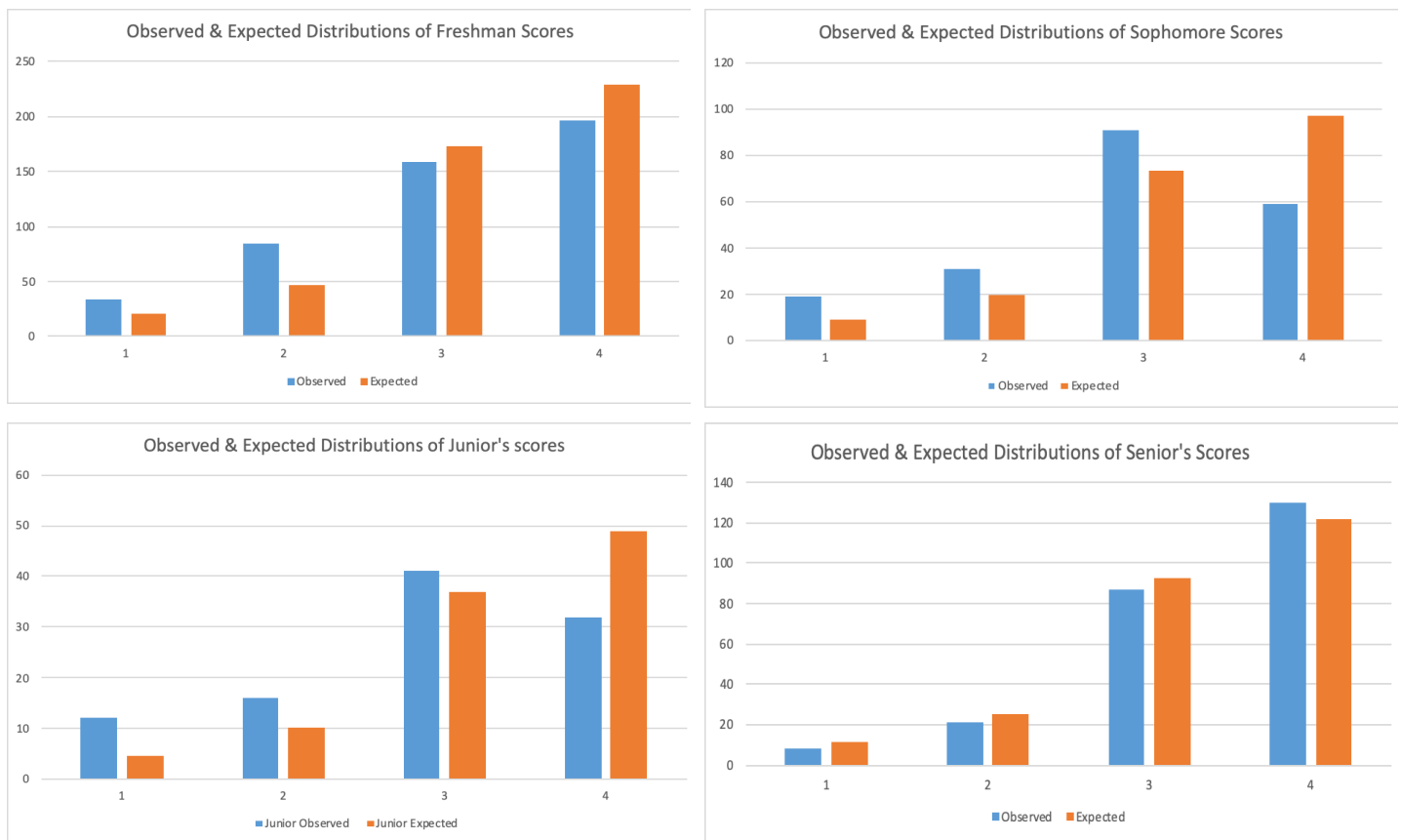


Figure 5.3.1 χ^2 Distributions by class status (p-values): A) Freshman (0.11), B) Sophomores (0.43), C) Juniors (0.83), Seniors (0.24).

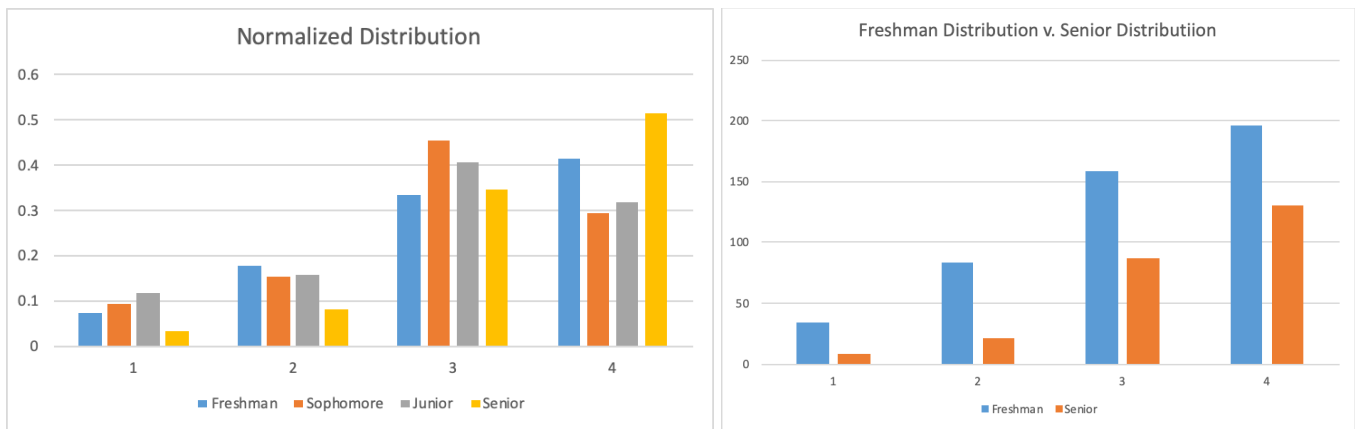


Figure 5.3.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.00011).

CCS5.4 Syntax, Grammar and Delivery

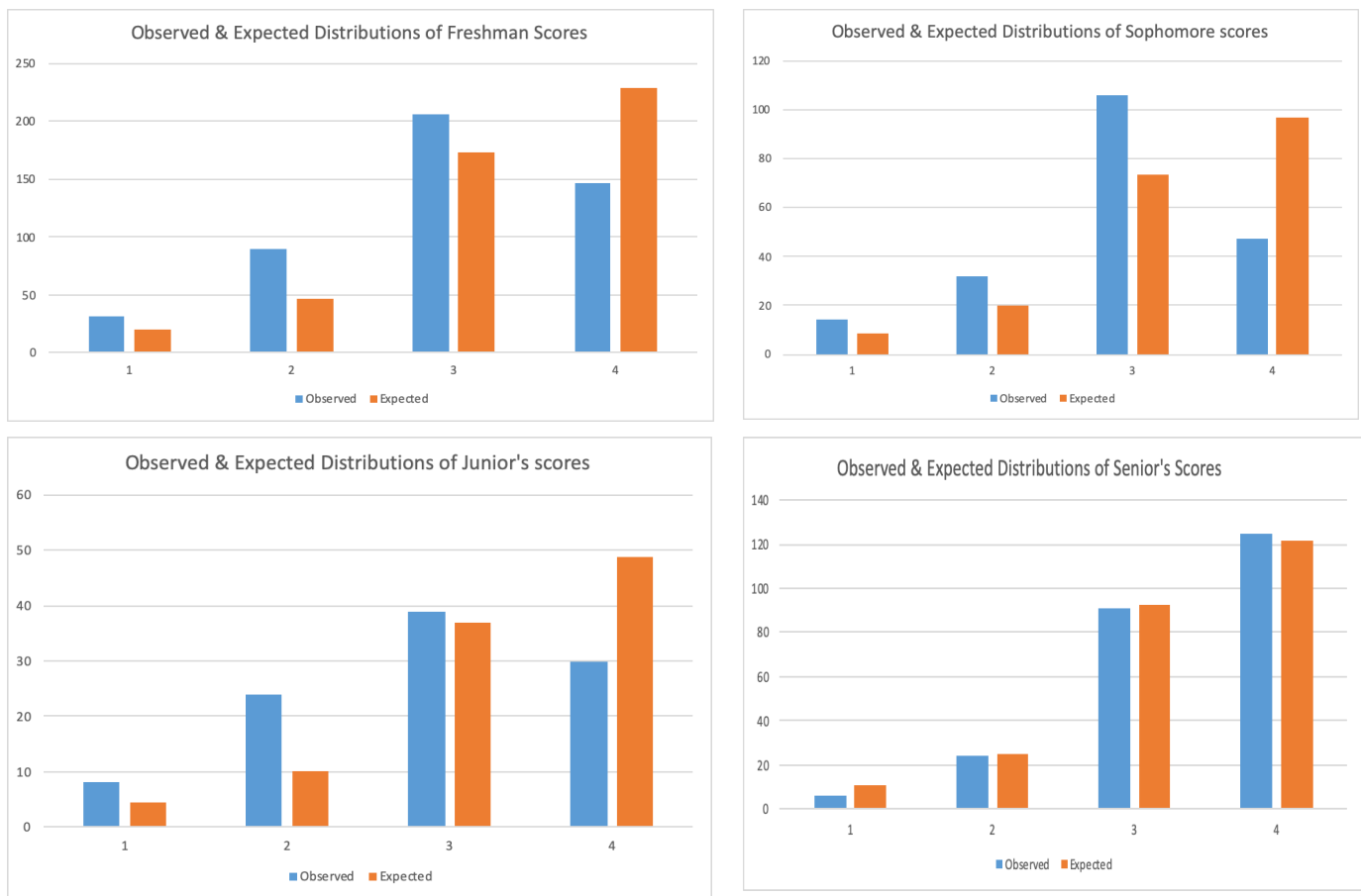


Figure 5.4.1 χ^2 Distributions by class status (p-values): A) Freshman (2.2×10^{-17}), B) Sophomores (5.5×10^{-11}), C) Juniors (1.6×10^{-6}), Seniors (0.49).

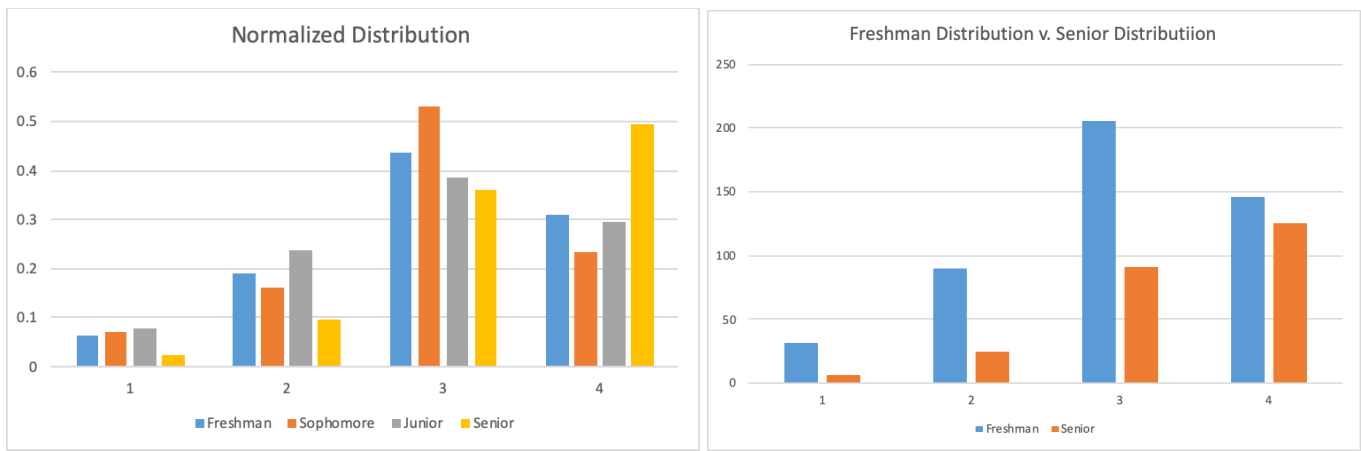


Figure 5.4.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.0×10^{-8}).

Critical Capacities and Skills 6: Collaboration

Collaborative skills for 13 courses were evaluated in the fall of 2018.

Collaboration requires students to demonstrate the ability to communicate effectively with others when figuring out solutions to complex problems. Students will demonstrate:

1. the ability to compromise and handle alternative viewpoints.
2. the ability to build consensus among group members.
3. the ability to identify group member strengths and utilize them appropriately.

For more information and to view the CCS6 rubric, please see http://www.minotstateu.edu/ge/documents/ge_app/ccs_6.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

CCS6.1 Consensus Building



Figure 6.1.1 χ^2 Distributions by class status (p-values): A) Freshman (9.1×10^{-6}), B) Sophomores (0.060), C) Juniors (0.33), Seniors (0.0020).

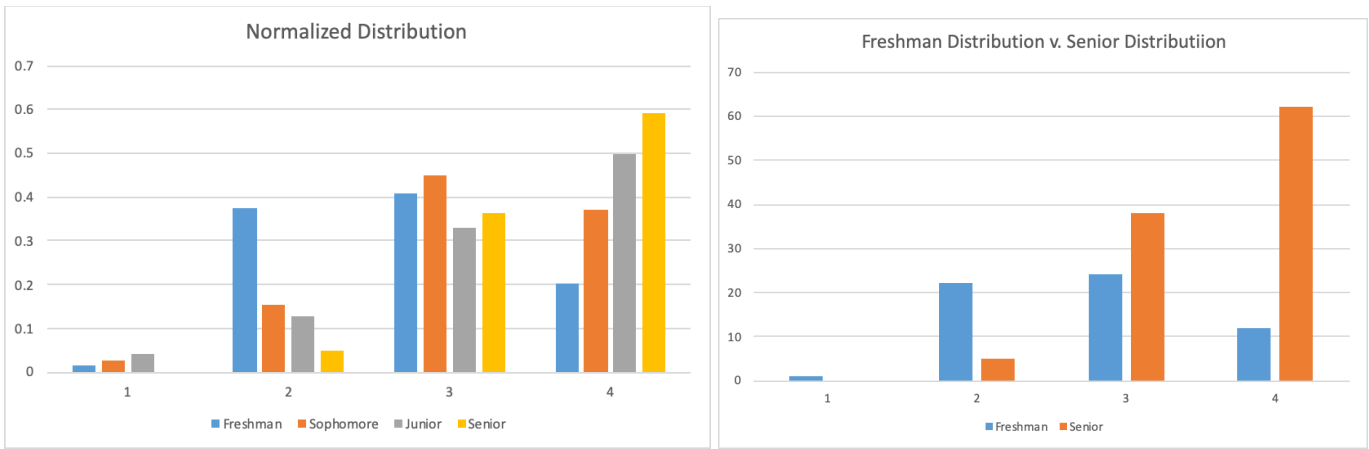


Figure 6.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 4.5×10^{-9}).

CCS6.2 Compromise

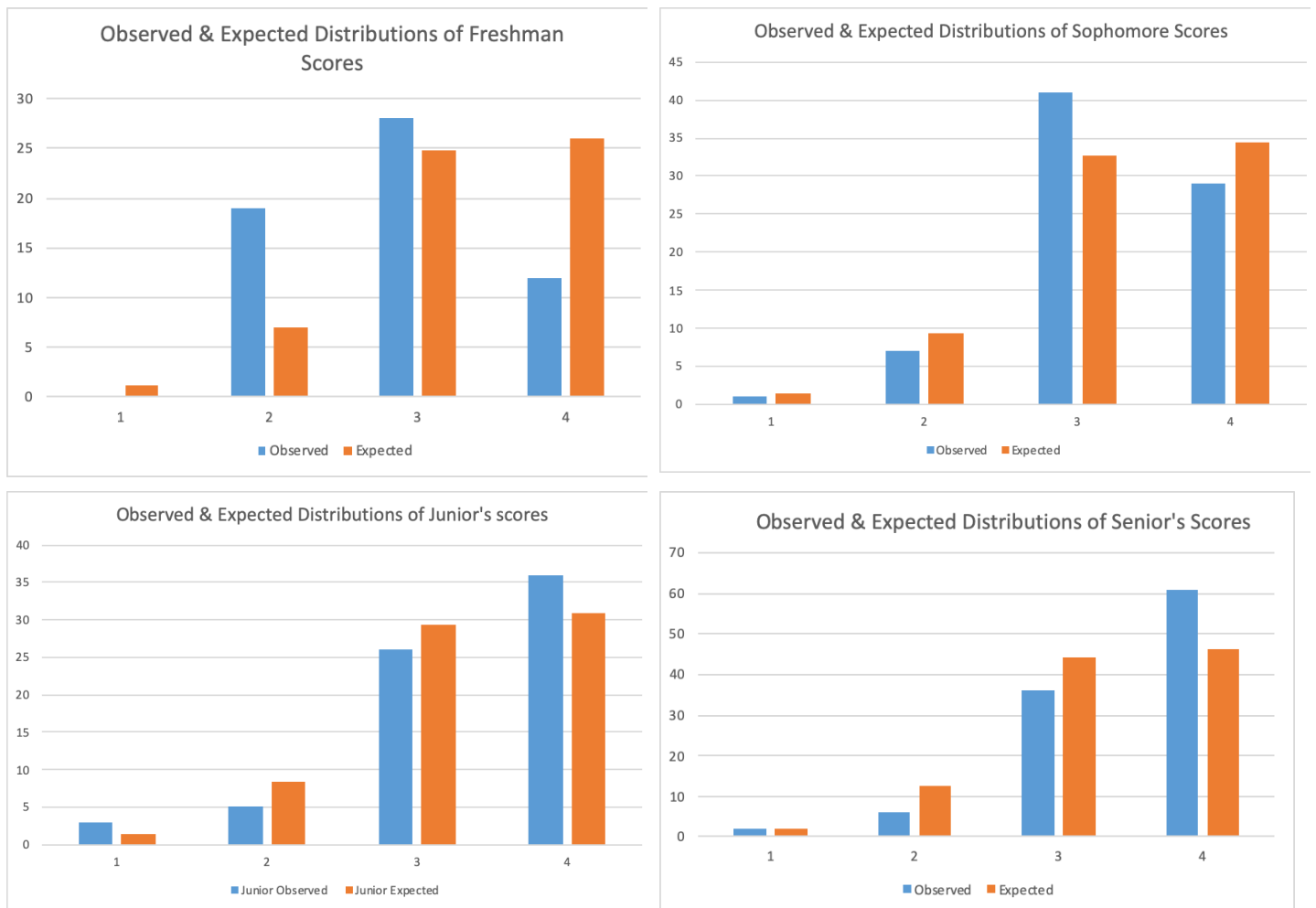


Figure 6.2.1 χ^2 Distributions by class status (p-values): A) Freshman (1.5×10^{-6}), B) Sophomores (0.30), C) Juniors (0.21), Seniors (0.025).

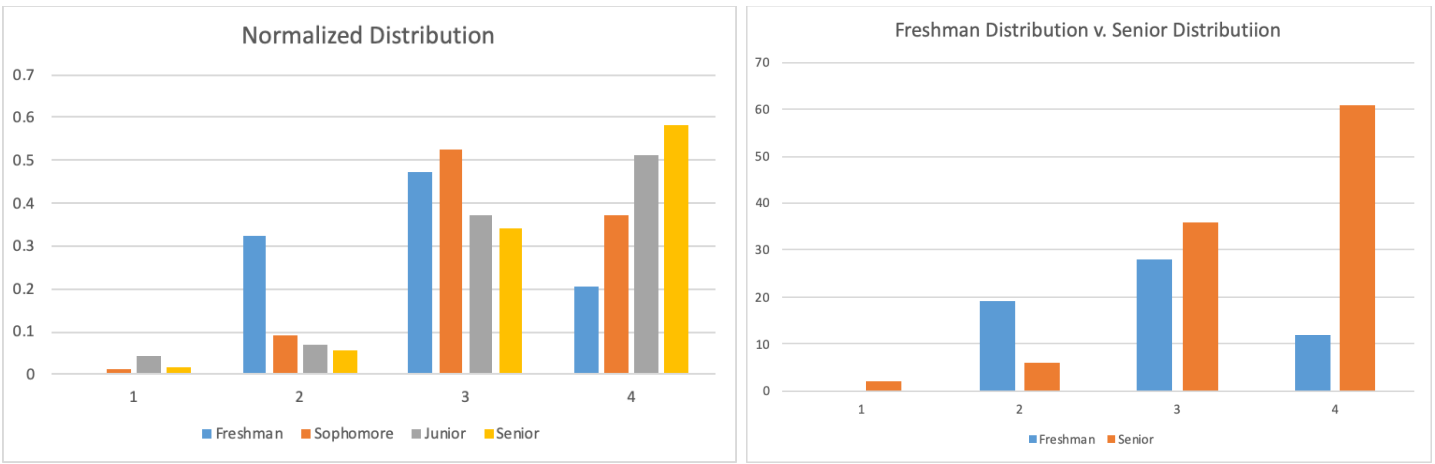


Figure 6.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 2.9×10^{-7}).

CCS6.3 Individual Member Assessment

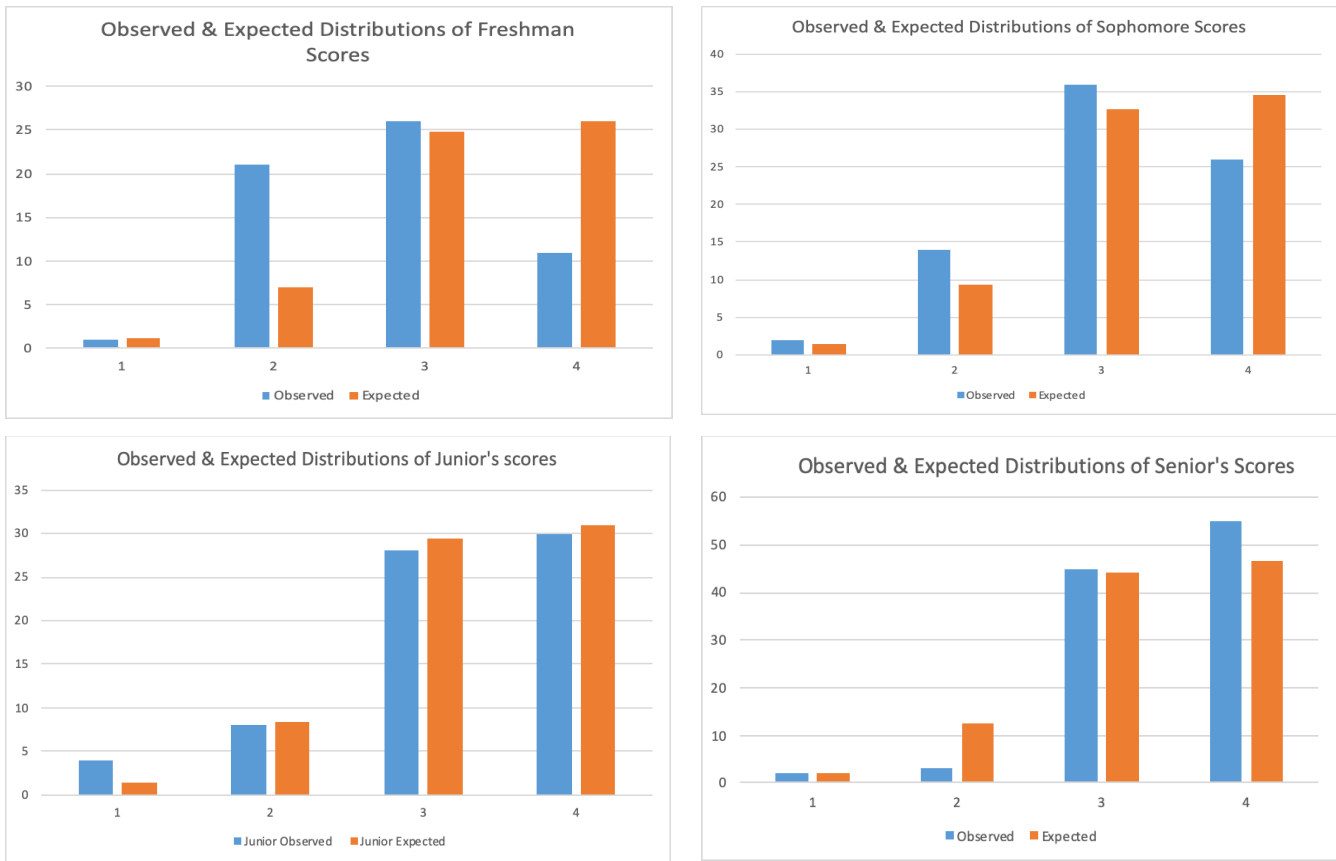


Figure 6.3.1 χ^2 Distributions by class status (p-values): A) Freshman (5.0×10^{-8}), B) Sophomores (0.17), C) Juniors (0.15), Seniors (0.033).

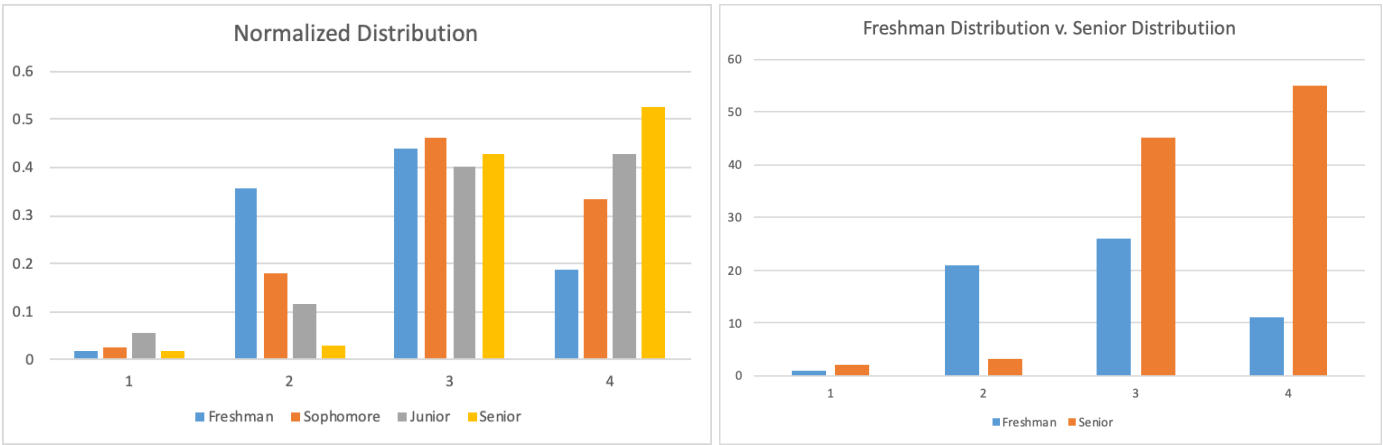


Figure 6.3.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 6.5×10^{-8}).

CCS6.4 Final Product

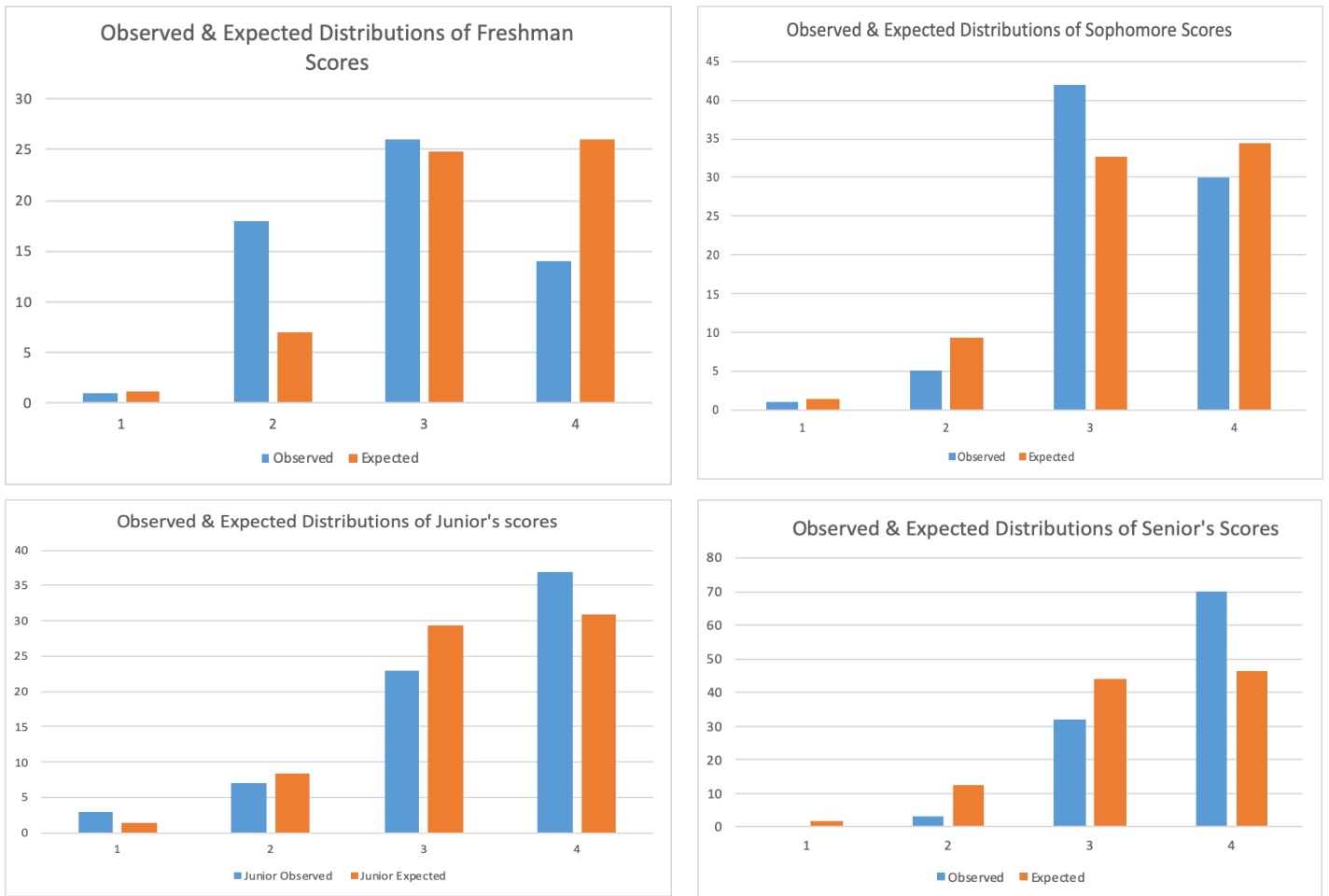


Figure 6.4.1 χ^2 Distributions by class status (p-values): A) Freshman (4.1×10^{-5}), B) Sophomores (0.15), C) Juniors (0.19), Seniors (2.0×10^{-5}).

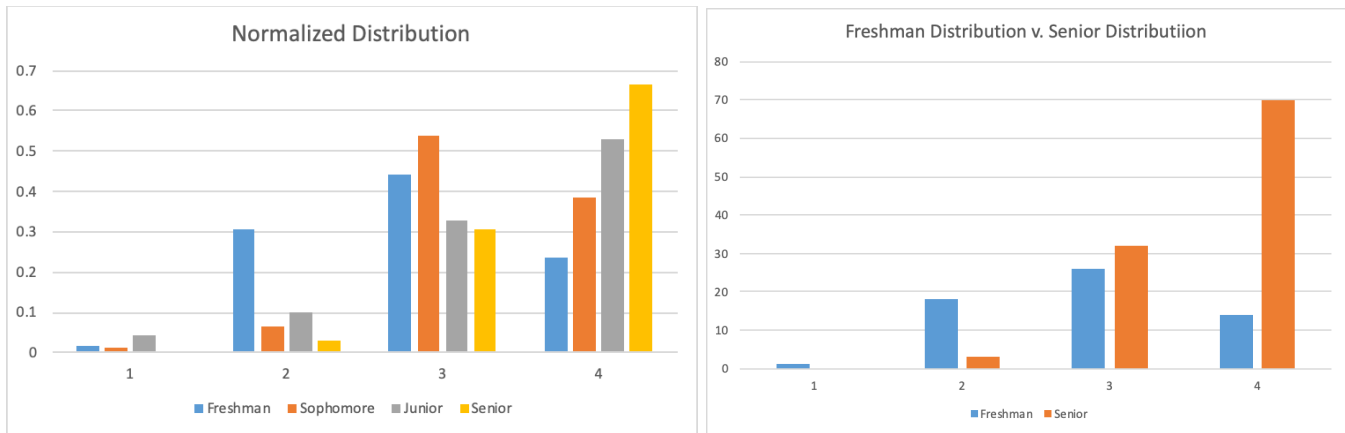


Figure 6.4.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.5×10^{-9}).

PERSONAL AND SOCIAL RESPONSIBILITY 1: RELATIONSHIPS AND VALUE SYSTEMS

Student's knowledge of relationships and value systems was assessed in 20 classes in the fall of 2017 and the spring of 2019

Relationships and value systems requires students recognize their relationships to communities and evaluate different value systems associated with community issues.

A. Relationships – Students will demonstrate the ability to recognize their relationships to communities.

B. Value Systems – Students will demonstrate the ability to evaluate different value systems associated with community issues.

For more information and to view the PSR1 rubric, please see http://www.minotstateu.edu/ge/documents/ge_app/psr_1.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

PSR 1.1 Relationships

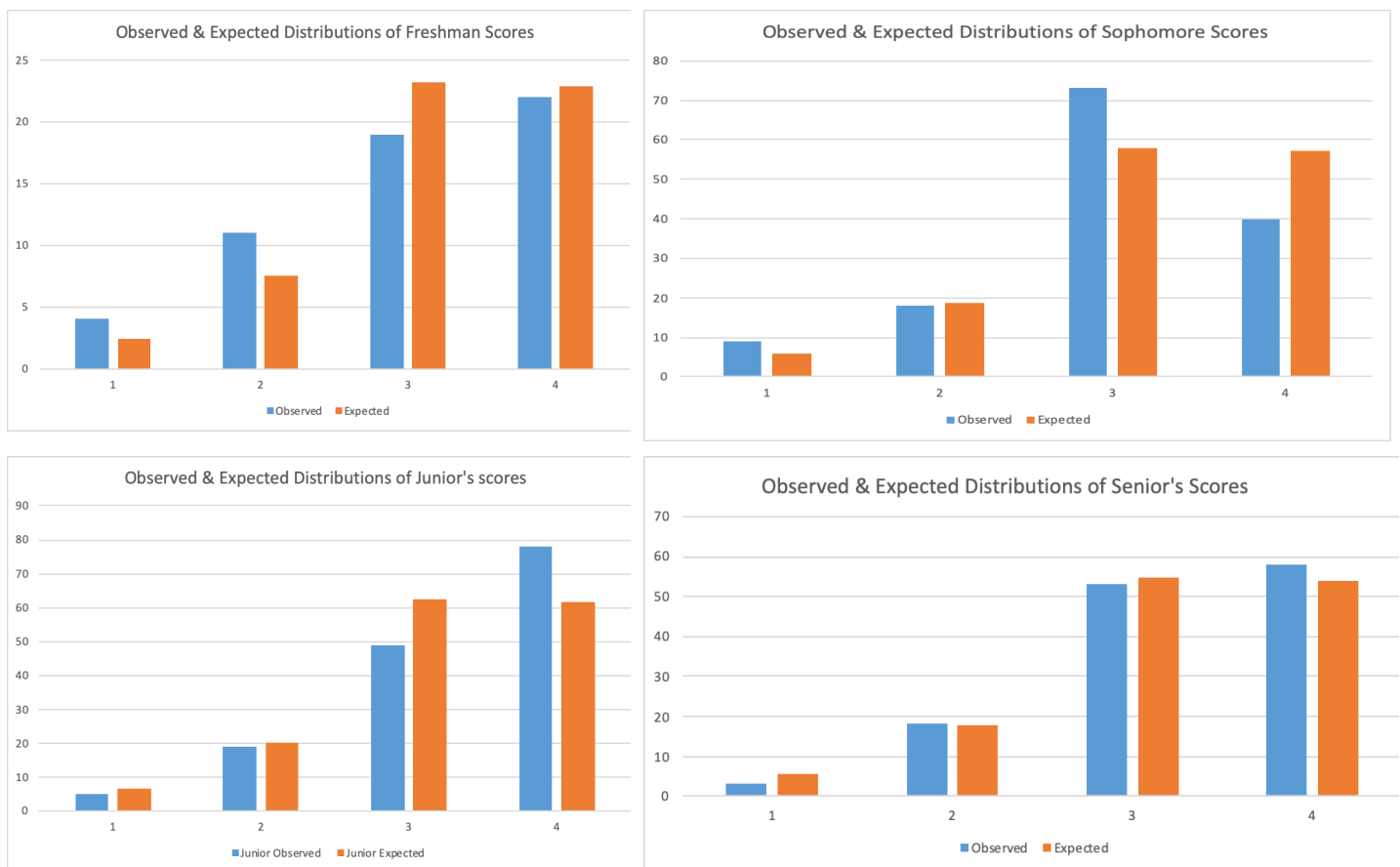


Figure 7.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.32), B) Sophomores (0.014), C) Juniors (0.053), Seniors (0.66).

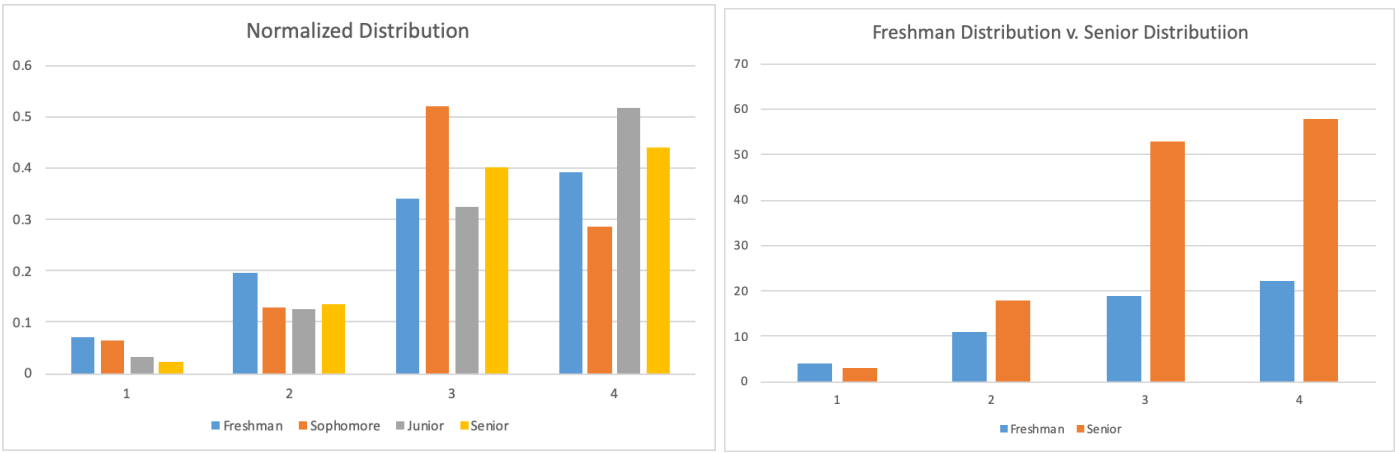


Figure 7.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.22).

PSR 1.2 Value Systems

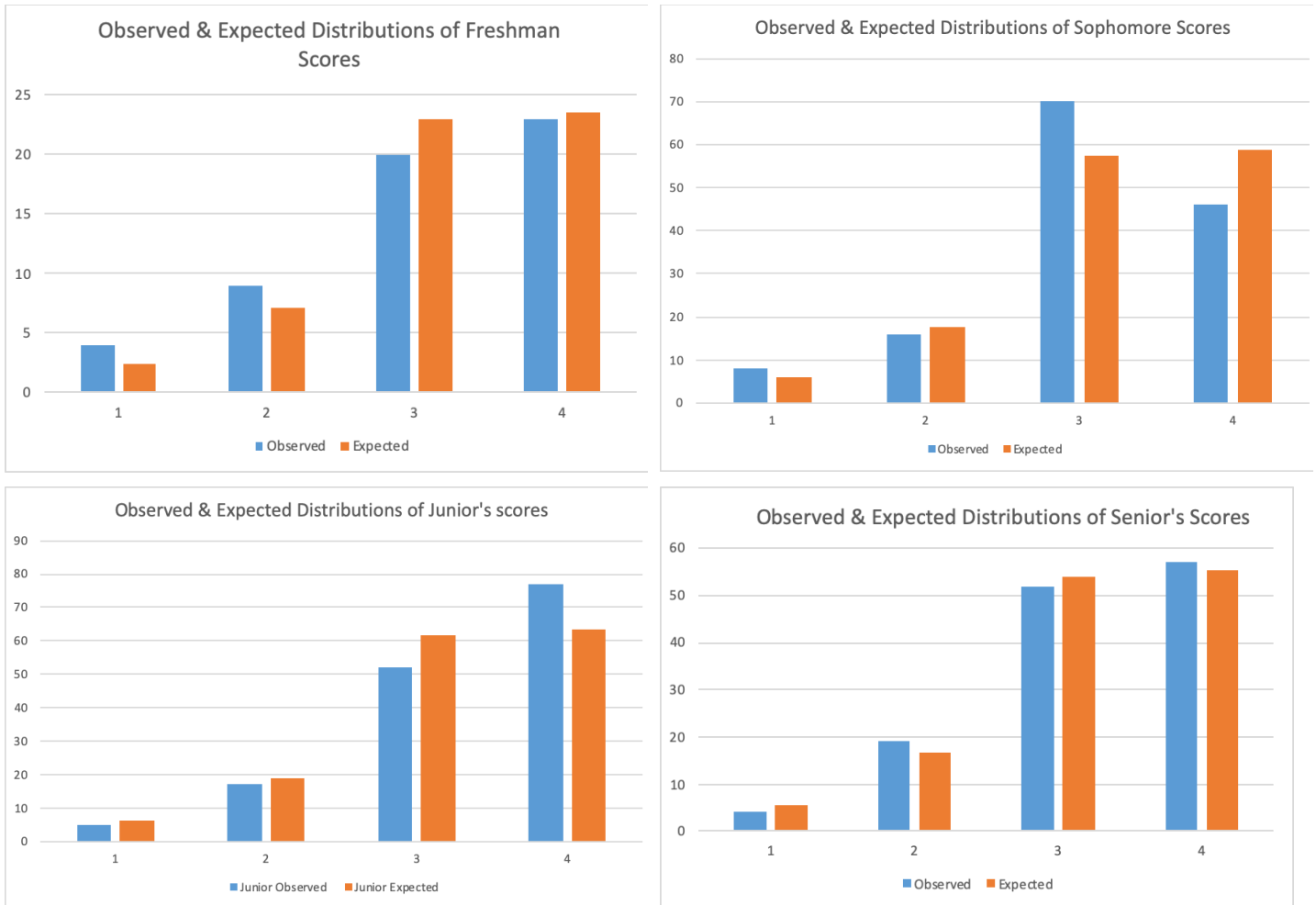


Figure 7.2.1 χ^2 Distributions by class status (p-values): A) Freshman (0.57), B) Sophomores (0.09), C) Juniors (0.17), Seniors (0.82).

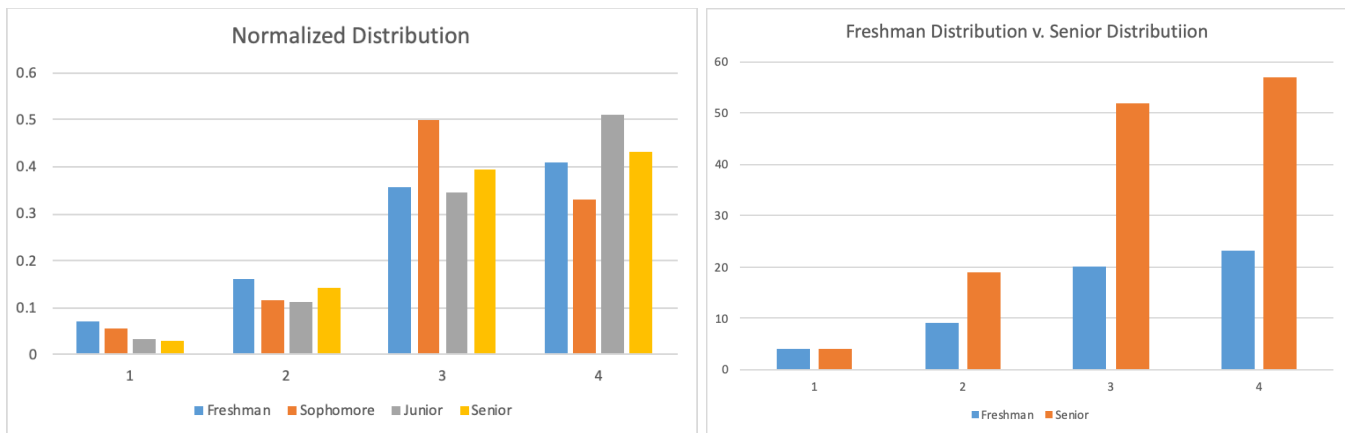


Figure 7.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.52).

Personal and Social Responsibility 2: Responding to Community Needs

Students' ability to Respond to Community Needs was surveyed in 41 courses in Spring 2018 and Fall 2019. Responding to community needs requires students respond to community needs by engaging in meaningful community activities. Students will demonstrate:

1. engagement in meaningful community activities.

For more information and to view the PSR2 rubric, please see http://www.minotstateu.edu/ge/documents/ge_app/psr_2.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

PSR 2.1 Responding to Community Needs

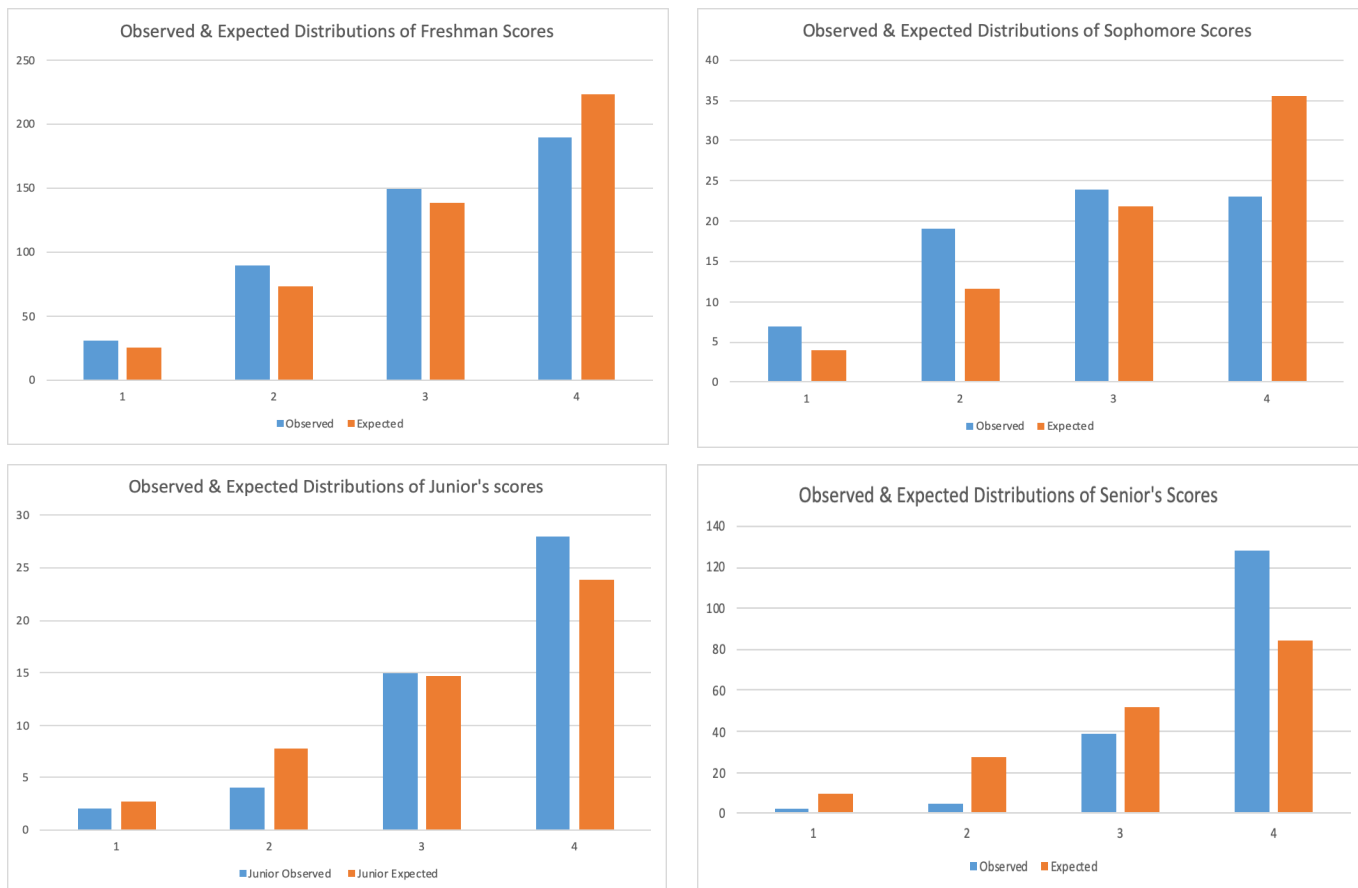


Figure 8.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.0097), B) Sophomores (0.0087), C) Juniors (0.44), Seniors (8.5×10^{-11}).

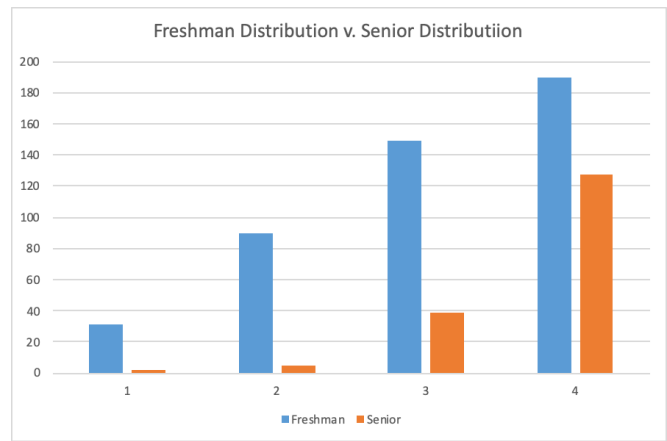
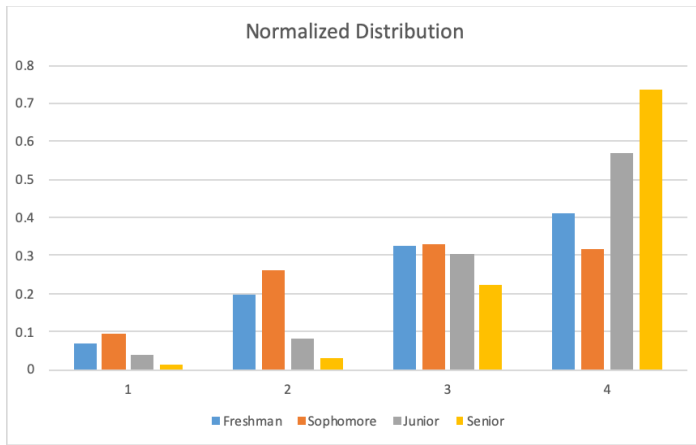


Figure 8.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 6.7×10^{-15}).

Personal and Social Responsibility 3: Individual Well-Being

Student's Individual Well-Being was assessed Fall 2018 in 19 courses

Individual well-being requires students exercise individual well-being by exploring and practicing healthy behaviors. Students will demonstrate:

1. The exploration and practice of healthy behaviors.

For more information and to view the PSR3 rubric, please see http://www.minotstateu.edu/ge/documents/ge_app/psr_3.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

PSR 3.1 Individual Well-Being

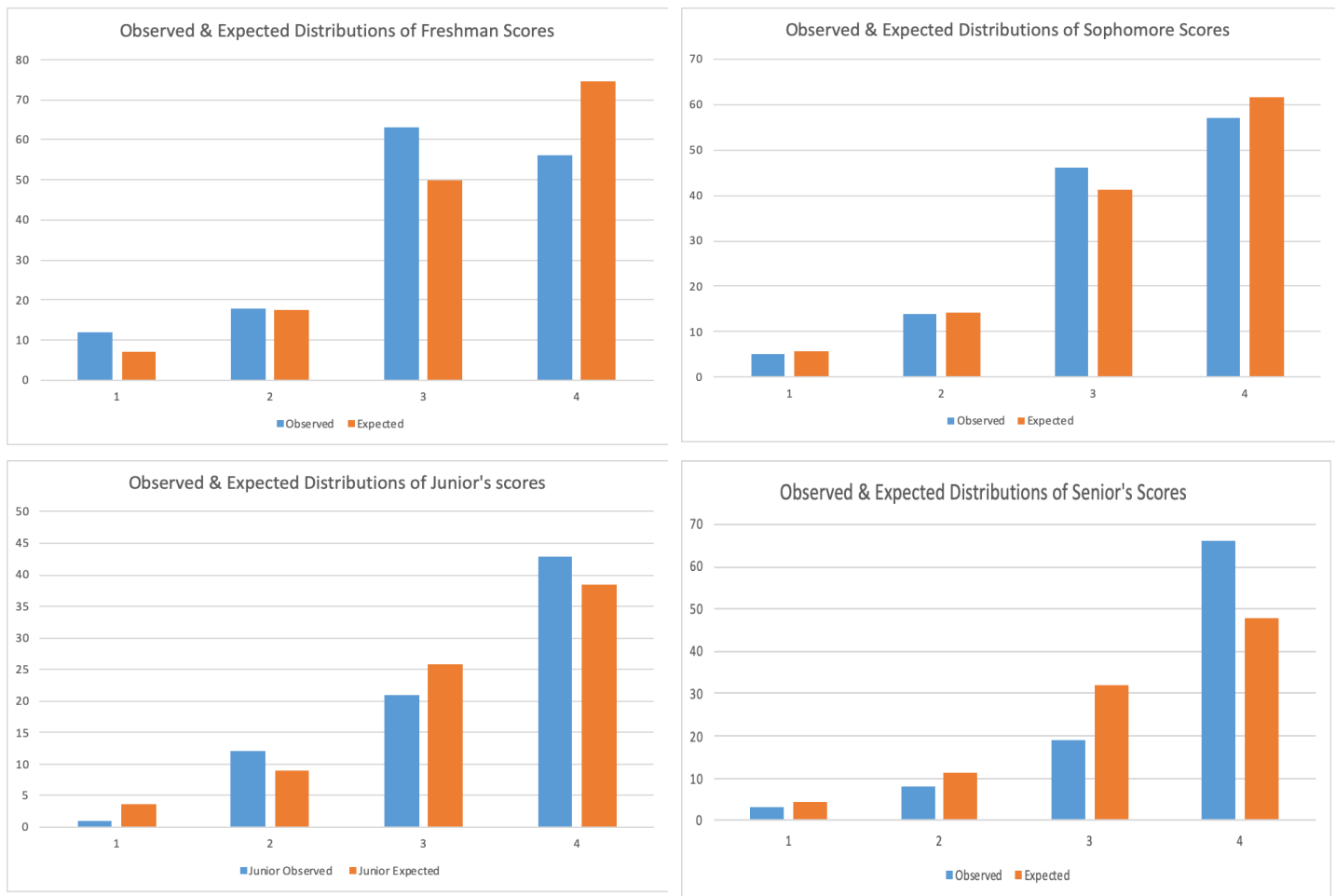


Figure 9.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.0087), B) Sophomores (0.79), C) Juniors (0.23), Seniors (0.0037).

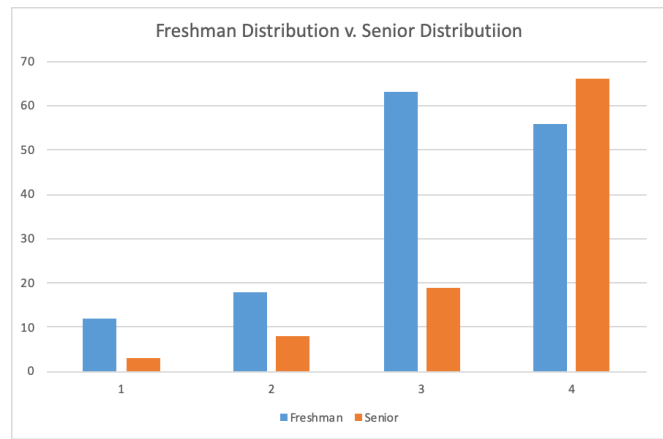
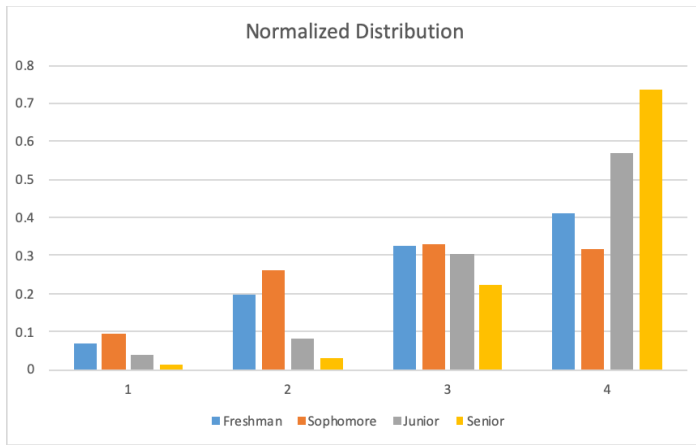


Figure 9.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 1.0×10^{-5}).

Interconnecting Perspectives 1: Knowledge

IP 1 was assessed in each semester between Spring 2017 and Fall 2019 covering 26 courses

Interconnecting perspectives: knowledge requires students demonstrate through coursework an understanding of diversity both globally and within the United States. The work product must serve to assess student knowledge of classifications of diverse groups and populations. In addition the product must serve to assess the student's knowledge of the characteristics of at least one diverse population or group within the global community. Students will demonstrate:

1. knowledge of cultural self-awareness;
2. knowledge of cultural worldview frameworks;
3. curiosity about other cultures.

For more information and to view the IP1 rubric, please see

http://www.minotstateu.edu/ge/documents/ge_app/ip_1.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

IP 1.1 Cultural Self-awareness

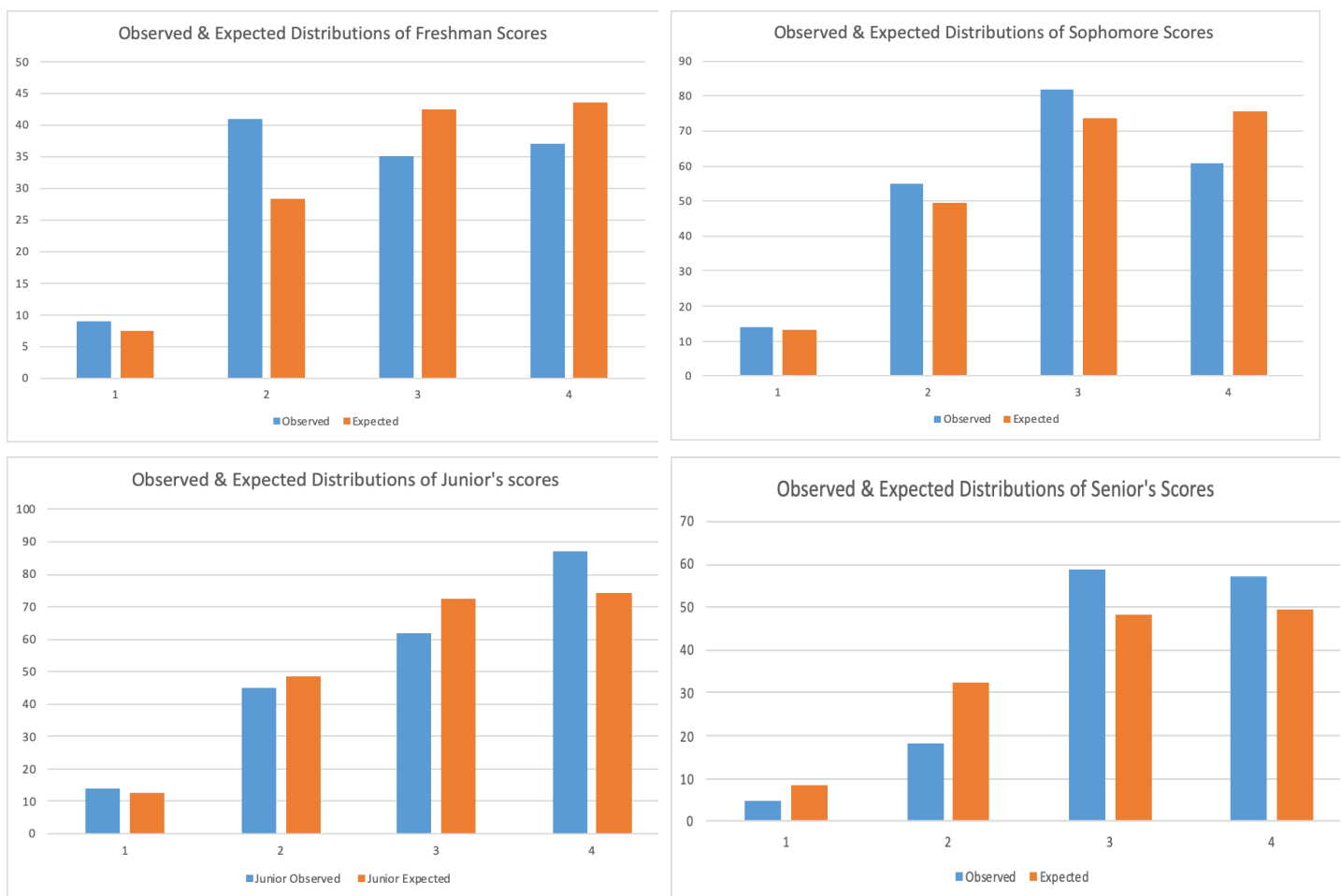


Figure 10.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.042), B) Sophomores (0.21), C) Juniors (0.26), Seniors (0.011).

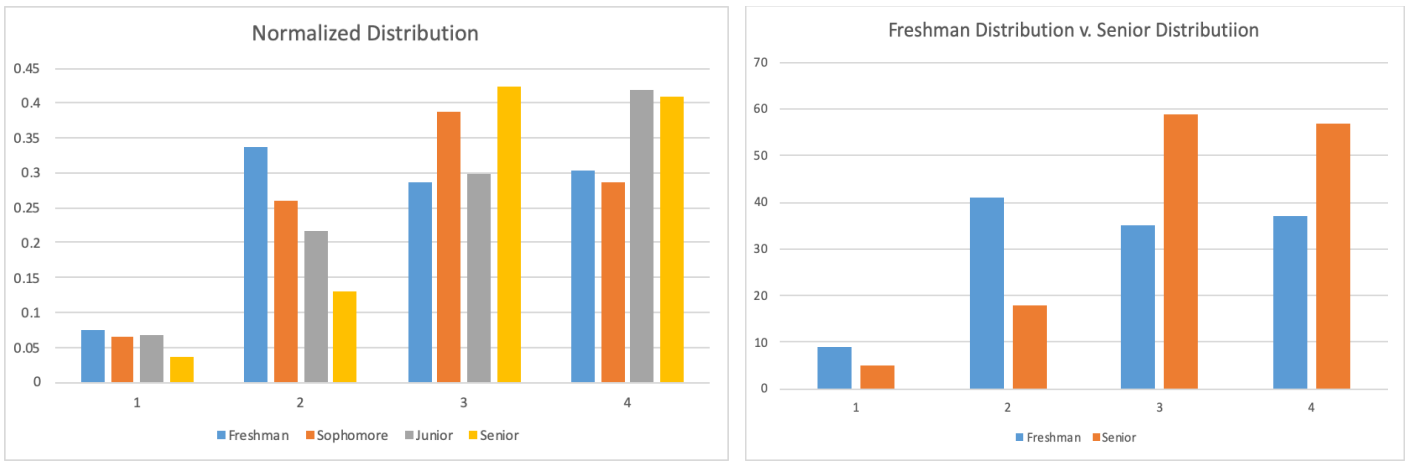


Figure 10.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.00068).

IP 1.2 Knowledge of Cultural Worldview Frameworks

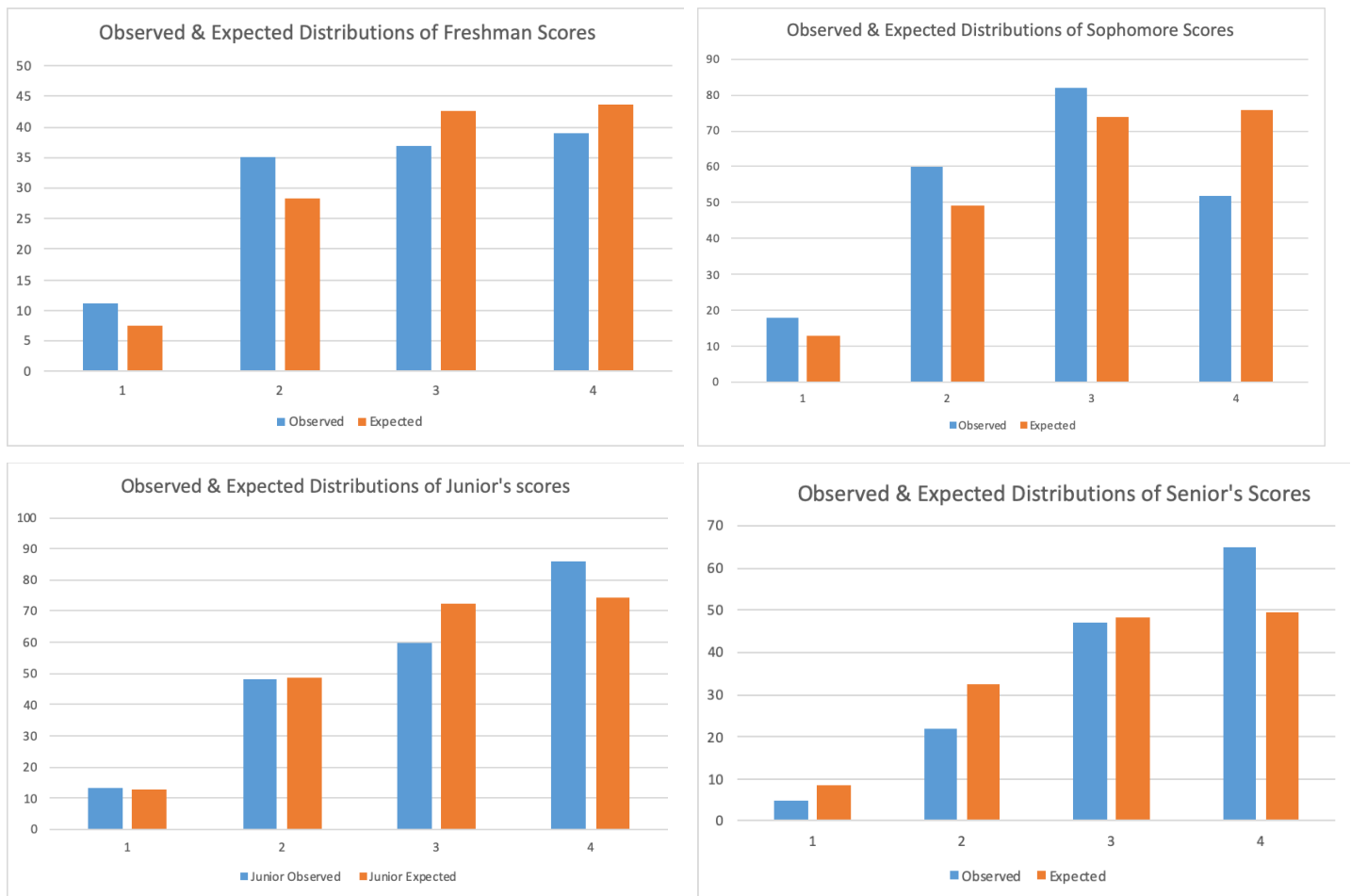


Figure 10.2.1 χ^2 Distributions by class status (p-values): A) Freshman (0.23), B) Sophomores (0.0060), C) Juniors (0.26), Seniors (0.023).

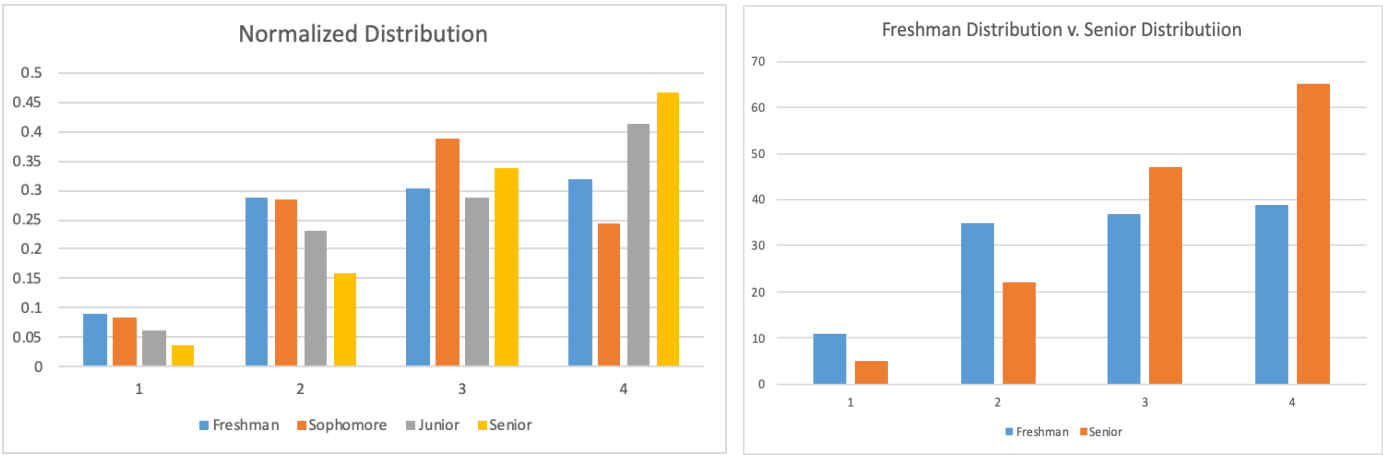


Figure 10.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.0011).

IP 1.3 Curiosity

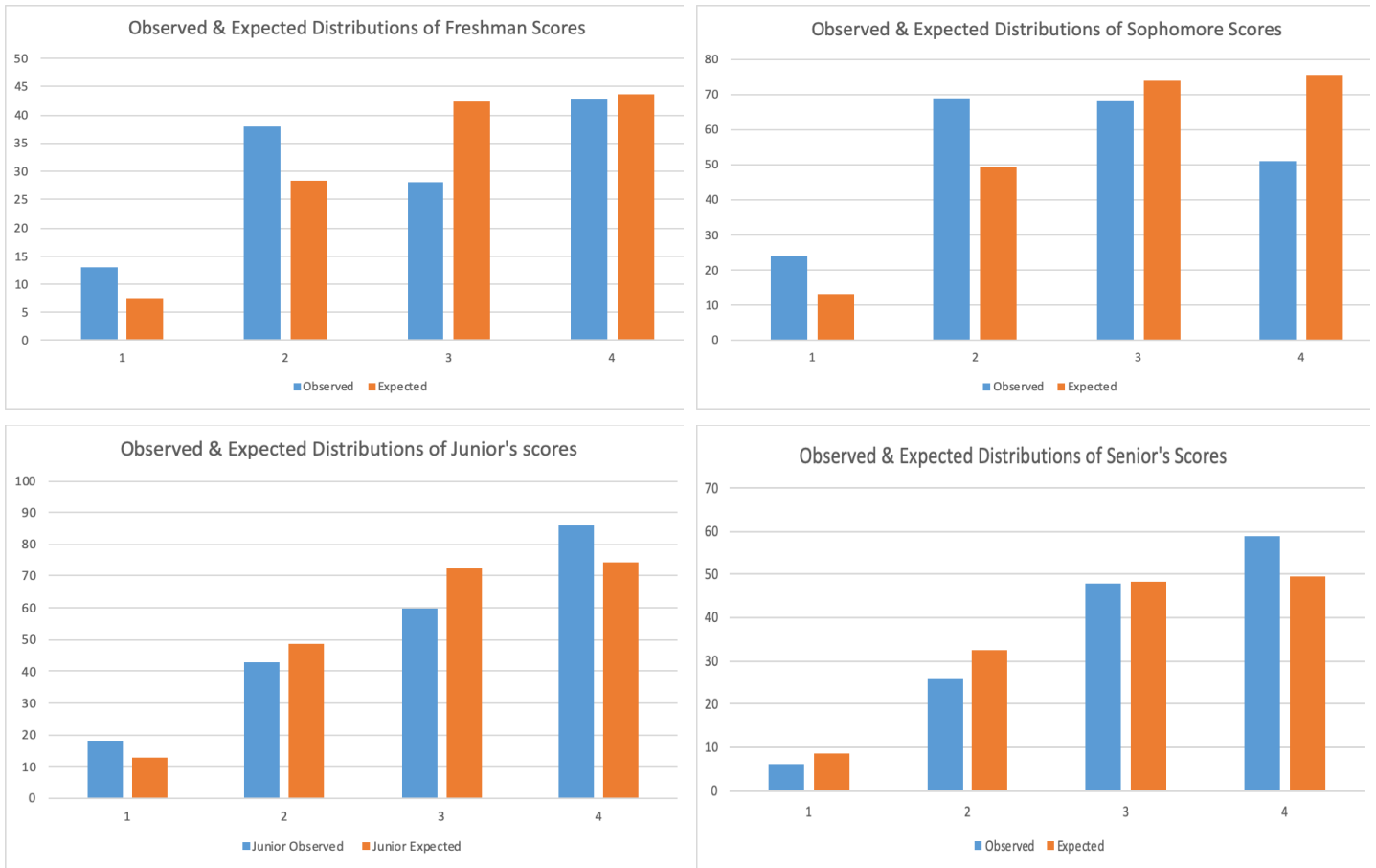


Figure 10.3.1 χ^2 Distributions by class status (p-values): A) Freshman (0.0067), B) Sophomores (1.1×10^{-5}), C) Juniors (0.081), Seniors (0.29).

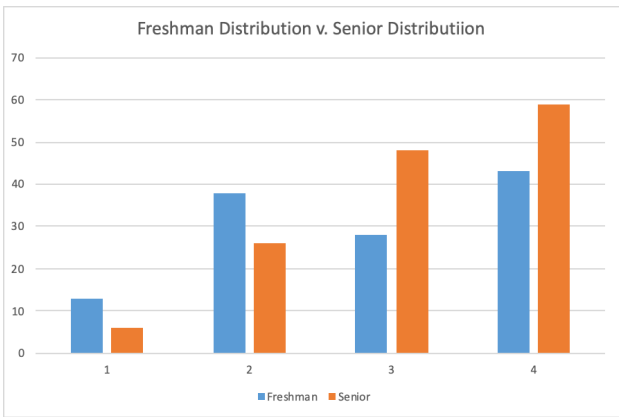
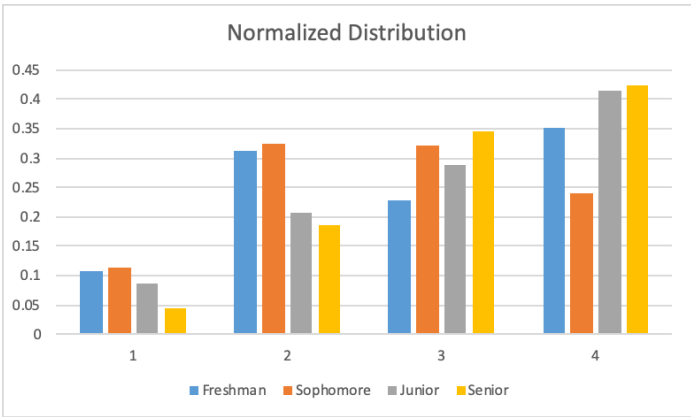


Figure 10.3.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.013).

Interconnecting Perspectives 2: Experience

IP 2 was assessed in each semester between Spring 2017 and Fall 2019 covering 37 courses

Interconnecting perspectives: experience requires students demonstrate through an applied experience an understanding of diversity both globally and within the United States. The work product must serve to assess students' understanding of diversity related to complex social issues, decisions and consequences. They should be able to draw upon and consider an increasingly diverse set of scientific, historical, cultural, and social perspectives to frame their arguments and should employ multiple ways of thinking about problems to both evaluate and respond to alternative viewpoints. Students will demonstrate:

1. knowledge of cultural self-awareness;
2. empathy and will recognize intellectual and emotional dimensions of more than one worldview;
3. openness in their interactions with other cultures.

For more information and to view the IP2 rubric, please see

http://www.minotstateu.edu/ge/documents/ge_app/ip_2.pdf.

Assessments ratings are 4 (Advanced), 3 (Sufficient), 2 (Basic), 1 (Insufficient).

IP 2.1 Knowledge of Cultural Worldview Frameworks

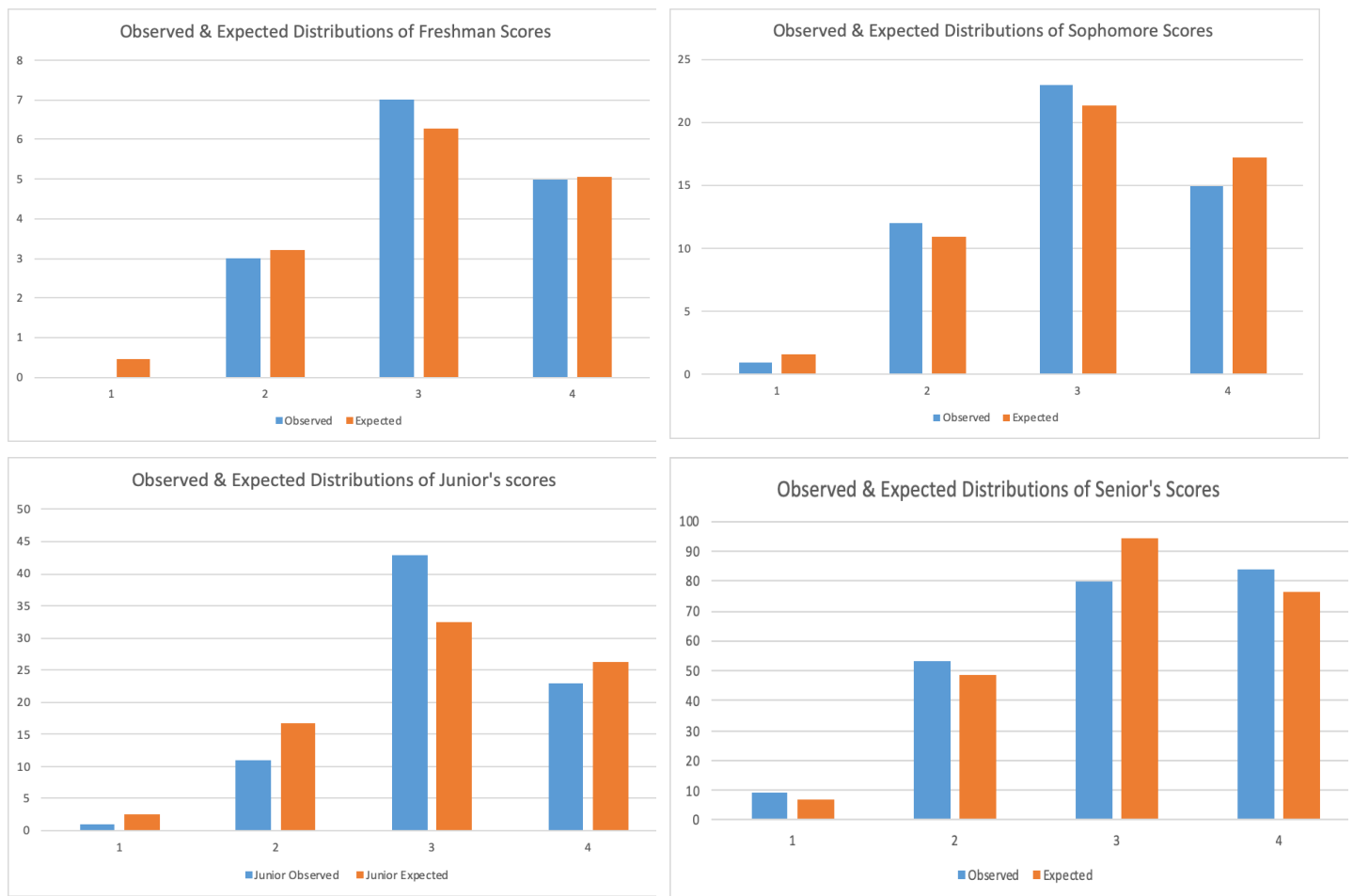


Figure 11.1.1 χ^2 Distributions by class status (p-values): A) Freshman (0.90), B) Sophomores (0.86), C) Juniors (0.089), Seniors (0.26).

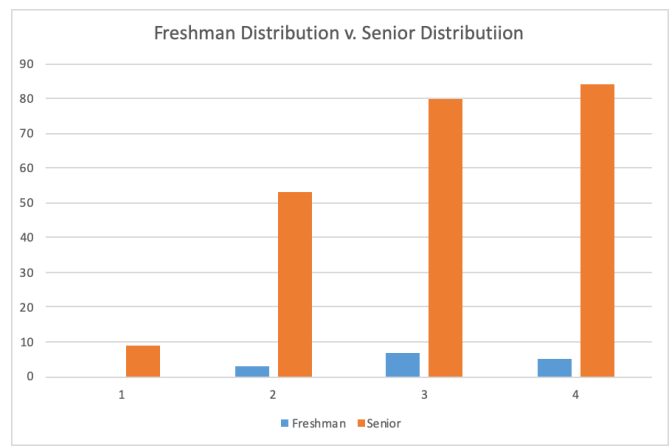
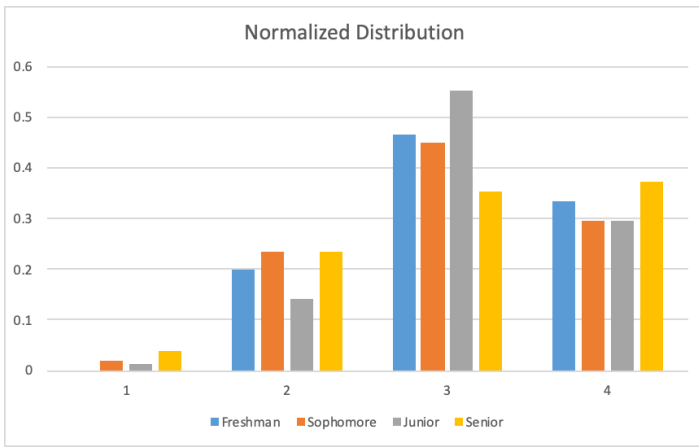


Figure 11.1.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.86).

IP 2.2 Empathy

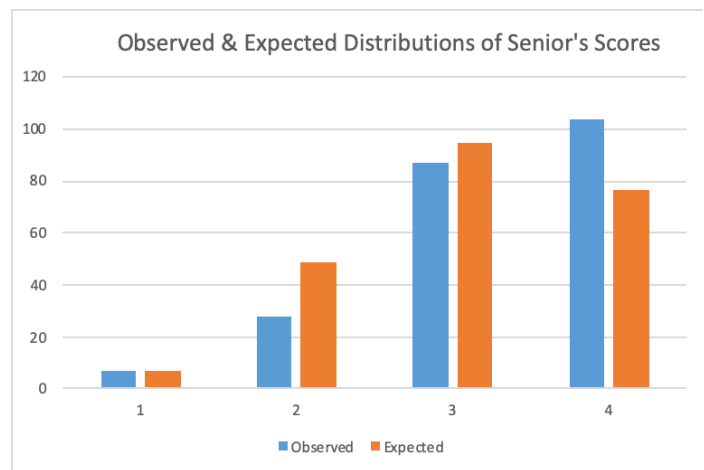
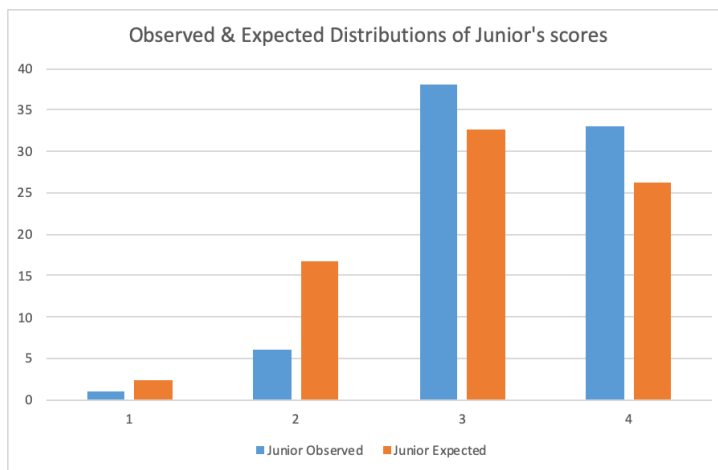
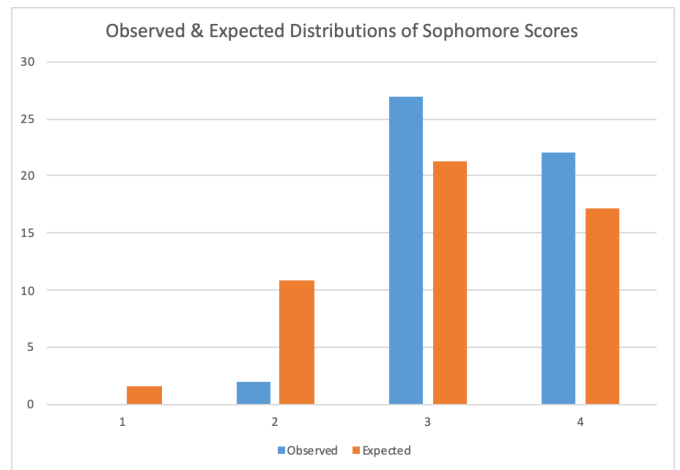
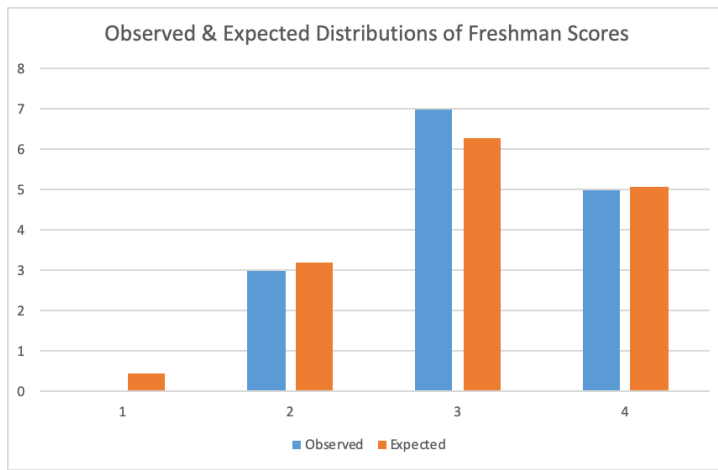


Figure 11.2.1 χ^2 Distributions by class status (p-values): A) Freshman (0.90), B) Sophomores (0.0084), C) Juniors (0.016), Seniors (0.00025).

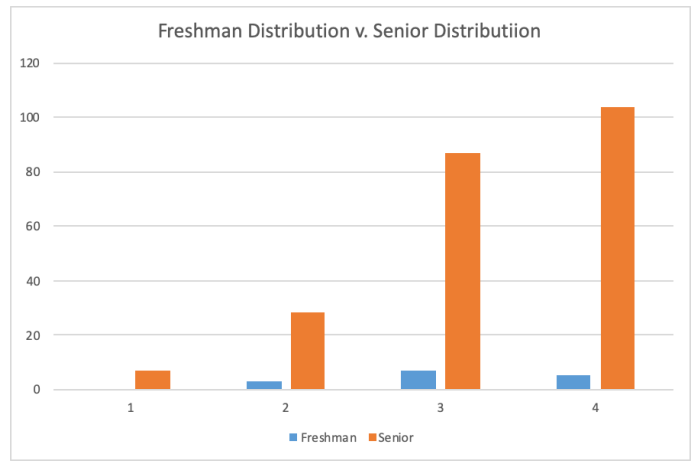
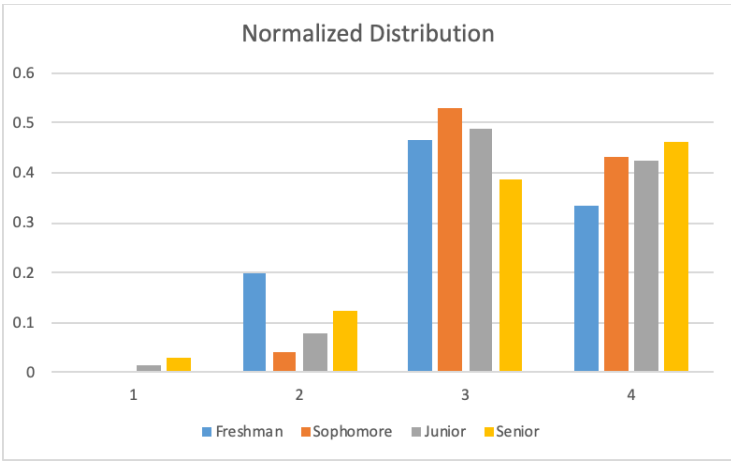


Figure 11.2.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.38).

IP 2.3 Openness

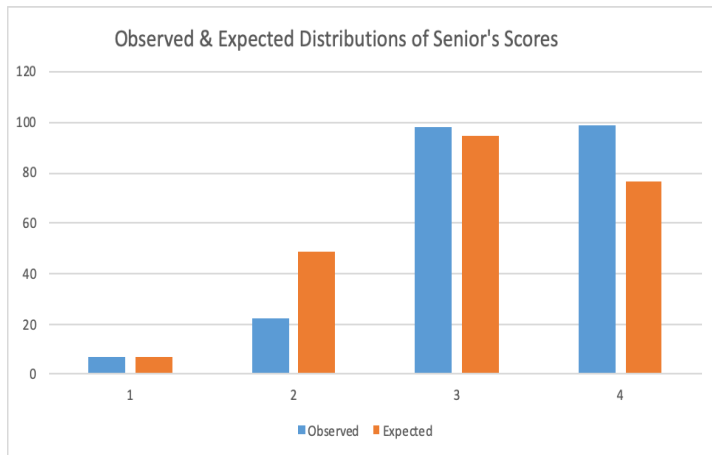
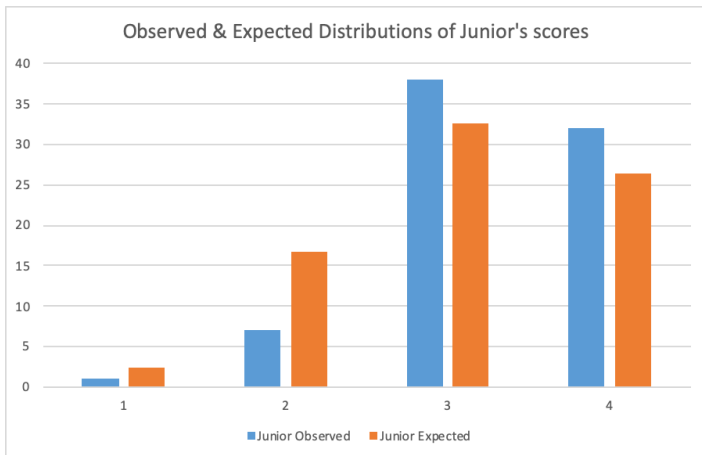
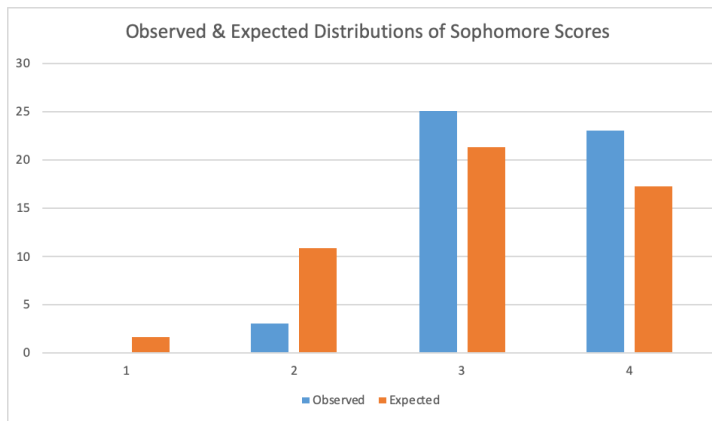
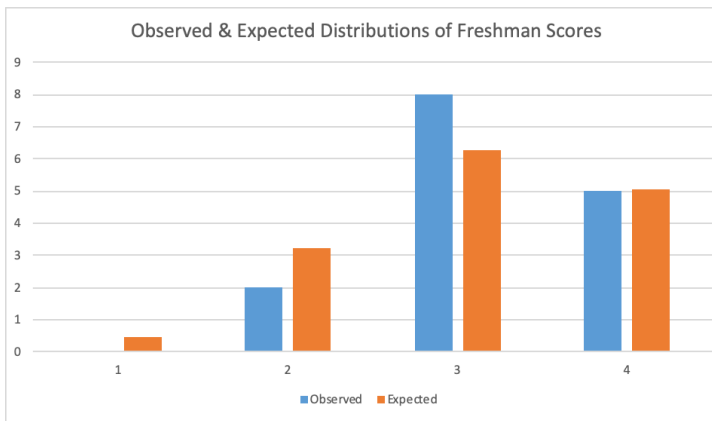


Figure 11.3.1 χ^2 Distributions by class status (p-values): A) Freshman (0.70), B) Sophomores (0.019), C) Juniors (0.036), Seniors (9.4×10^{-5}).

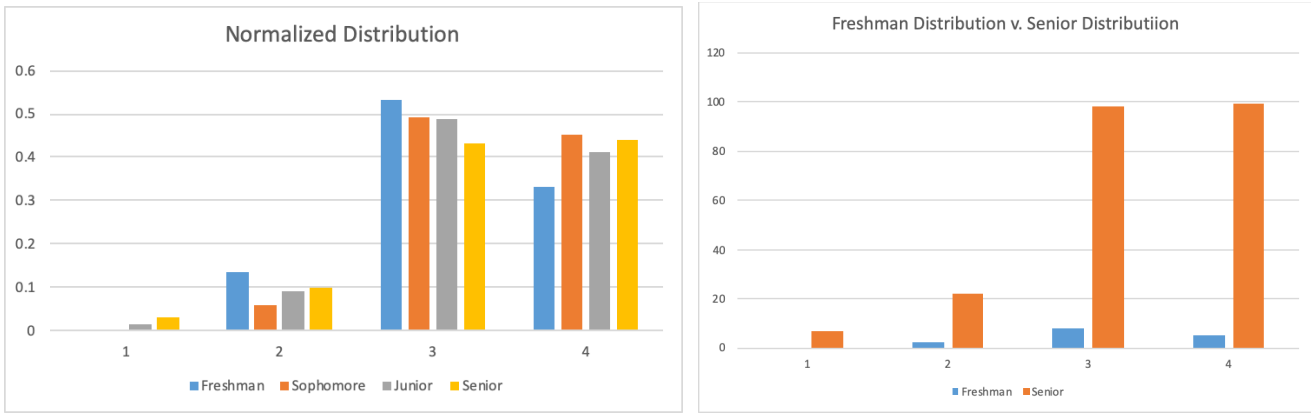


Figure 11.3.2 A) Normalized distribution of class scores. B) Distribution of Freshman v. Senior scores (Mann-Whitney p-value = 0.52).

SECTION D: ANALYSIS

Our second round of analyses were largely consistent with the analyses completed at the end of 2018. Significantly higher performance was observed for seniors compared to freshman in 20 of the 22 criteria within the CCS category. As in the 2019 report, we observed significantly higher performance from seniors compared to freshman in 2 of the 4 PSR categories. Within the IP category additional data aided in demonstrating significant performance differences between seniors and freshman in half of the 6 criteria. Additional data led to a year over year increase in the number of general education subcategories showing significantly higher performance from seniors compared to freshman from 6 to 8 of the 11 subcategories. At this point the General Education would reiterate the suggestion of the Academic Assessment Committee reports that further refinement of the data collection process is in order. This is primary recommendation of committee below.

In the below we briefly address the statistical significance of each general education category, as well as, a brief interpretation of the data.

CCS1 – Problem Solving

Seniors exhibited significantly higher ratings than freshmen in each of the four subcategories (fig. 1.1-1.4): ‘problem solving’ ($p=0.00019$), ‘determination of alternative problem solutions’ ($p=0.00050$), ‘evaluation of evidence’ ($p=4.9 \times 10^{-9}$) and ‘selection of problem solution’ ($p=1.6 \times 10^{-8}$). Each of the subcategories exhibited a pattern that was common in the majority of general education subcategories wherein freshman possessed a higher percentage of lower scores. Scores progressively increased with academic standing with the seniors scoring the highest percentage of fours (fig. 1.1-1.4). The majority of freshman, typically in excess of 70%, garnered ratings of sufficient (3) or advanced (4), despite the fact that freshman tended to have a higher percentage of ‘insufficient’ (1) and ‘basic’ (2) ratings compared to those of more advanced academic standing.

CCS2 – Information Literacy

Seniors exhibited significantly higher ratings than freshmen in each of the five subcategories (fig. 2.1-2.5): ‘determine the nature and extent of information needed’ ($p=5.8 \times 10^{-11}$), ‘access information’ ($p=1.9 \times 10^{-13}$), ‘evaluate information and its sources critically’ ($p=2.1 \times 10^{-11}$), ‘use information effectively to accomplish a planned objective’ ($p=5.5 \times 10^{-8}$) and ‘use information ethically and legally’ ($p=1.3 \times 10^{-10}$). Each of the subcategories exhibited a pattern that was common in the majority of general education subcategories wherein freshman possessed a higher percentage of lower scores. Scores progressively increased with academic standing with the seniors scoring the highest percentage of fours (fig. 2.1-2.4). Although the majority of freshman again garnered ratings of sufficient (3) or advanced (4) this percentage was lower than observed in the previous category tending towards 50% of freshman population. This is similar to the situation pointed out in the last assessment report. The previous report suggested that “a more meaningful approach toward improving freshmen and sophomore performance might be setting targets no more than one standard deviation of separation between groups. Or, a minimum performance average/mean of 2.5 for all student groups across all rubric items.” It would appear that this criterion has been met under the current scheme.

CCS3 – Critical Reading

There was no new data to consider in this analysis since this category will not be reassessed until the end of spring 2020. Our analysis using non-parametric tests is consistent with analyses from the previous report. Namely, seniors exhibited significantly higher ratings than freshmen in each of the three subcategories (fig. 3.1-3.3): ‘contextualization’ ($p=1.6 \times 10^{-10}$), ‘interpretation’ ($p=2.3 \times 10^{-10}$), ‘academic discourse’ ($p=1.8 \times 10^{-9}$). As in the previous categories the pattern persisted wherein freshman possessed a higher percentage of lower scores and scores progressively increased with academic standing with the seniors scoring the highest percentage of fours (fig. 1.1-1.4). In contrast to the previous categories 50% or more freshman scored below sufficient in each of the three subcategories.

CCS4 – Quantitative Literacy

As in the previous year's report there was no significant difference between the performance of freshman and seniors in either of the quantitative literacy categories (fig 4.1-4.2). Nor indeed was there significant departure from the expected distribution for any of the academic levels (freshman, sophomore, junior, senior). Although a slightly higher percentage of freshman performed at the 'insufficient' level compared to the rest of the academic classes the performance level was generally comparable between academic levels for the 'basic', 'sufficient' and 'advanced' ratings. The members of the General Education would advise caution in interpreting these results. As in the previous year's analysis, the current lack of statistical significance stems from a lack of statistical power ($\beta=0.69$ & 0.62 , respectively; $n=281$ freshmen, $n=245$ seniors) in this instance. We estimate that it would take 700 freshmen and 700 seniors in order to obtain sufficient statistical power ($\beta=0.2$) to accept the null hypothesis (no difference between freshmen and seniors) and reject alternative hypotheses; thus, avoiding a type II error. It is worth noting that freshman, like the other three academic levels, perform particular well in this category, with over 70% of freshman performing at the sufficient or advanced level. What can not be ascertained given the current data collection method is whether a single class in the category is so effective that it moves the majority of participants into the sufficient or advanced categories or whether student enter the course with a high level of quantitative literacy competency. This perspective diverges significantly from that of the previous report and will be further addressed in Section F.

CCS5 – Oral and Written Communication

Seniors exhibited significantly higher ratings than freshmen in each of the four subcategories (fig. 5.1-5.4): 'targeting' ($p=0.001$), 'content development and organization' ($p=0.00058$), 'sources and evidence' ($p=0.00011$) and 'syntax, grammar and delivery' ($p=1.0 \times 10^{-8}$). Interestingly the distribution pattern in this category differed from that seen in most of the other categories in which higher academic status was associated with higher performance. In this category the percentage of freshmen demonstrating insufficient performance was below that of sophomores and junior. In fact, sophomores and juniors generally performed significantly below expectation in χ^2 analysis. However, there was no significant difference between the performance of freshman, sophomores and juniors (data not shown). We concur with the previous year's report that this category bears watching in future iterations as more data becomes available.

CCS6 – Collaboration

As with CCS3 there was no new data to consider in this analysis since this category will not be reassessed until the end of spring 2020. Our analysis using non-parametric tests is not surprisingly consistent with analyses from the previous report. Namely, seniors exhibited significantly higher ratings than freshmen in each of the four subcategories (fig. 6.1-6.4): 'consensus building' ($p=4.5 \times 10^{-9}$), 'compromise' ($p=2.9 \times 10^{-7}$), 'individual member assessment' ($p=1.8 \times 10^{-9}$) and 'final product' ($p=1.5 \times 10^{-9}$). As in the previous categories the pattern persisted wherein freshman possessed a higher percentage of lower scores and scores progressively increased with academic standing with the seniors scoring the highest percentage of fours (fig. 5.1-5.4). It is notable that the performance of exceptionally few students among all academic levels was classified as 'insufficient'.

PSR1 – Relationships and Value Systems

As with last year's analyses we again found that seniors did not perform significantly better than freshman in either subcategory of PSR1 (fig. 7.1 & 7.2). This situation is analogous to the lack of significance observe in CCS4 and due primarily to a lack of statistical power ($\beta=0.76$ & 0.90). Analysis indicates that approximately 800 students at each academic level would be required to have sufficient statistical power to accept the null hypothesis and reject alternative hypotheses. The lack of significance in this case is a result of the small sample size, particular freshman. As with CCS4 a high percentage of students from all academic levels performed at the 'sufficient' or 'advanced' level. Likewise, current data collection method limited our ability to determine whether a single class in the category is so effective that it moves the majority of participants into the sufficient or advanced categories or whether student enter the course with a sophisticated understanding their relationship to their community and

appreciation of different value systems level. We would reiterate the question posed in last year's report "...at what level (target) do MSU faculty believe students should be performing?" The previous report raised the possibility that freshman being assessed in the spring of 2019 may have significantly different distribution than those assessed in the fall of 2017. Mann-Whitney analysis of freshman 2017 and 2019 distributions exhibited no significant difference between the two groups ($p=0.28$; fig. 12) although this statistic too is underpowered ($\beta=0.8$).

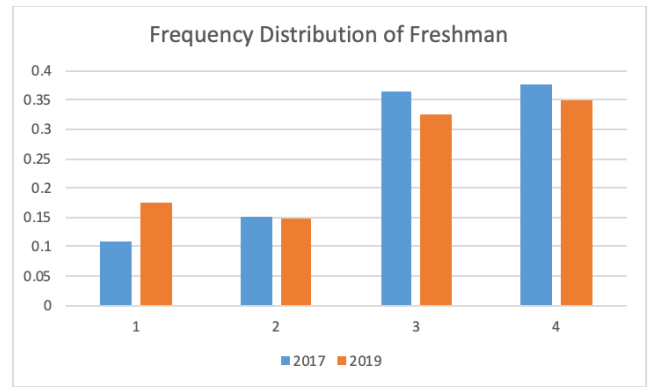


Figure 12. Comparison of the frequency distribution of freshman scores during 2017 and 2109.

PSR2 – Responding to Community Needs

Senior performance was significantly higher than freshman in their response to community needs (fig. 8.1.2). While freshman performance in this category was comparable to their performance in the majority of other categories, the performance of seniors was notably higher, with nearly 75% of seniors considered 'advanced' and significantly higher than expected (fig. 8.1.1D). The fact that freshman performance in this category was comparable to their performance in the majority of other categories should allay concerns expressed in the earlier report that a performance score of 'insufficient' is overrepresented among freshman students. The most parsimonious explanation for the difference between freshman and seniors is that seniors have internalized the values espoused in this developmental category to a greater extent than freshman, although the forces leading to this developmental increase can not be definitively determined under current methodology.

PSR3 – Individual Well-Being

Seniors again exhibited significantly higher ratings than freshmen in this category ($p=1.0 \times 10^{-5}$; fig. 9.1.2). As in other categories, freshman scores were below expectation (fig. 9.1.1A) while senior scores were significantly above expectation (fig. 9.1.1D). Although not as pronounced this category continued the trend of increasing scores commensurate with increasing academic level. The majority of students performed at the 'sufficient' or 'advanced' level.

IP1 – Knowledge

Seniors exhibited significantly higher ratings than freshmen in each of the three subcategories (fig. 10.1-10.3): 'cultural self-awareness' ($p=0.00068$), 'knowledge of cultural worldview frameworks' ($p=0.0011$), 'curiosity' ($p=0.013$). This is an instance where additional data provided enough statistical power to resolve the apparent lack of significant difference between freshmen and seniors in last year's report. This situation will be further addressed in section D below. Each of the subcategories exhibited a pattern that was common in the majority of general education subcategories wherein freshman scores were significantly lower than expected, sophomores and juniors performed as expected and seniors performed above expectations. Scores progressively increased with academic standing with the seniors scoring the highest percentage of fours (fig. 10.1-10.3).

IP2 – Experience

The results and concerns with this category are nearly identical to those of the previous report. Seniors did not perform significantly better than freshman but this analysis is severely limited by the fact that the category contains only 15 freshmen (50% more than the previous report). The analyses did benefit from the addition of nearly five times as many sophomores and twice as many juniors as in the previous report. Interestingly, sophomores, juniors and seniors exhibited significantly greater 'empathy' and 'openness' than expected (fig. 11.21 & 11.3.1). Because IP2 is a experiential category is typically not fulfilled until the junior or senior year which severely limits the ability draw comparisons with lower-level students and make the argument that developmental

progression can be attributed to the course/experience. This category would be best served by establishing a pre-course/experience baseline which will be discussed in section F.

SECTION E: FOLLOW-UP AND RESPONSES TO PREVIOUS RECOMMENDATIONS

In their 2019 General Education Assessment report the Academic Assessment Committee focused their concerns on general education categories CCS4 and IP1 and suggested a number of perceived issues to be addressed. This concern arose primarily from the lack of a significant difference in the performance between freshman and seniors. However, additional analysis by the General Education committee has revealed that the lack of significance was the result of a lack of statistical power (see Section D) which led to incorrectly rejecting the alternative hypothesis in favor of the null when in fact there was not enough statistical support to accept or reject either hypothesis. The fact that with additional data all subcategories of IP1 now exhibit significant differences between freshmen and seniors and display the same trends found in the majority of categories would appear to validate this position. It is essential that going forward the committee remain cognizant of the role of statistical power before accepting the null hypothesis.

Furthermore, analysis across all categories is confounded by the fact that the current reporting methodology does not allow us to distinguish between students that have had multiple exposures to a general education category and those that have had only a single exposure. To date the presumption has been that seniors will have had multiple exposures to a general education category. Anecdotal evidence, however, would suggest that there exist two populations of seniors; those with multiple exposures and those with a single exposure. This issue will be further addressed in section E below.

The Academic Assessment Committee listed a number of concerns for these two categories beginning with inter-rater reliability. Comparison of the distribution of scores within two categories of concern to other general education categories reveals that the distributions are remarkably similar. This would suggest that inter-rater reliability is not an issue. Were this a concern determining Cohen's Kappa statistic may be an appropriate response but would require establishing the rater evaluation methods before administering the assessment to students. Similarly, blinding assessment evaluations so the academic status of the student was not known would perhaps be a more viable approach if rater reliability were a concern.

Similarly, the Academic Assessment committee questioned whether students were being given a rating of one when they did not complete or participate in the assignment(s)? The distribution of the data clearly indicates that this is not the case as there were very few ones (1) being given on any of the assignments.

The Academic Assessment committee also questioned the role demographic factors may have played in observed lack of significance. Again, given the lack of statistical power it would be inappropriate to accept the null hypothesis that there was no difference between freshmen and senior scores. None-the-less the role demographic factors may play in outcomes is certainly an interesting one and one that could be addressed by implementing the recommendations below in section F.

SECTION F: RECOMENDATIONS

As described in Section B (Methodology and Limitations) the statistical analysis in this report aimed to distinguish between three hypotheses for each of the categories:

- Null hypothesis – The distribution of scores between Freshmen and Seniors did not differ significantly ($\alpha=0.05$, $\beta=0.2$) because the course instruction had little to no impact on the students' learning outcomes.
- Alternative hypothesis #1 – The distribution of scores was significantly higher for Seniors than Freshman because exposure to similar course content in multiple courses during a Senior student's college career has resulted in greater assimilation of learning outcomes compared to the single exposure among Freshmen.
- Alternative hypothesis #2 – The distribution of scores was significantly higher for Seniors than Freshman because undefined forces such maturity and greater life-experience has led Senior students to assimilate lessons similar to those taught during an instructional course.

To date the presumption has been that seniors will have had multiple exposures to a general education category. Anecdotal evidence, however, would suggest that there exist two populations of seniors; those with multiple exposures and those with a single exposure. The General Education committee believes that it would be fairly easy to begin collecting longitudinal data on individual students by tying student identification numbers to general education assignment results. This simple adjustment opens a number of analytical possibilities, including the ability to definitively distinguish between students that have had multiple exposures to similar course content and those with only a single exposure. We anticipate that this change would result in more robust analyses and present the possibility for paired statistical analyses. Furthermore, it would allow the possibility of exploring the role demographic factors in outcomes, as suggested by the Academic Assessment committee.

The assessment results of PSR1 and IP2 possess a unique challenge as was pointed out in both the current and previous assessment reports. Namely, analyses are severely limited by the lack of opportunities for lower-level students to participate in these categories. Furthermore, there appears to be limited opportunities for students to receive multiple exposures to these categories. The General Education committee suggests that this category would be best served by establishing a pre-course/experience baseline. The committee recommends that this would that a pilot study be conducted whereby a pre-course/experience assessment is administered at the beginning of the course and that the same assessment is administered again at the end of the course. Intermediate language classes may be a good place to pilot this approach in order to work administration and reporting methodologies.
