On January 21, 2021, 39 LHU faculty/staff met to listen to the report by Dr. Troy Dermota, Chair of the Outcomes Assessment Committee and Chemistry Professor, on the Three-Year Trends Results and Actions for two General Education Learning Outcomes. Natural Sciences Inquiry and Critical Thinking trends were recently reported by and discussed by the General Education Sub-Committee (GES) of the University Curriculum Committee (UCC). The process takes time so that the data and actions are discussed at various stages before being received by the UCC after the GES submits the report. Dr. Dermota presented the three-year trends for Natural Sciences Inquiry, a report he also compiled. He also presented the trends report for Critical Thinking based on the information compiled by Elsa Winch and Dr Lynn Bruner. Comments and suggestions were made by the presenter and faculty/staff.

Natural Sciences Inquiry Findings and Discussion

1. Results from the trends review show that students who were enrolled in laboratory classes performed better on the competencies for this set of learning outcomes than students who were enrolled in classes without labs.
2. Actions taken by academic programs across the three years showed evidence of improving student learning in courses that had been taught regularly over the years.
3. Competencies by students were met at an appropriate level.

Further discussion included questions and comments related to data included in lab courses and data included in non-lab courses. The data reported consisted of both types of course results. It was suggested to also include data aggregated by type of class (lab and non-lab) so that results would include the total results as presented in this report and the aggregated by class results.

Critical Thinking Findings and Discussion

1. Discussion ensured related to the language in the current Critical Thinking rubric leaning to a focus on Philosophy course outcomes. Comments and discussion included a recommendation to revisit the language of the rubric so that a broader view occurs in assessing Critical Thinking as it is done at
other campuses. This could be done with more of an emphasis on multiple types of measures and aligning to higher order thinking as seen in Bloom’s Taxonomy. This allows multiple disciplines to engage better in the assessment of Critical Thinking.

2. Discussion also revolved around the level of courses with approved Critical Thinking student learning outcomes. The question was asked, “Can 100-level courses really be compared with upper division courses for Critical Thinking learning outcomes?”

3. Comments were made that the areas of the rubric with common challenges for students included the demonstration of alternative perspectives and solutions when learning about theories, arguments and other ideas in courses. Additionally, synthesizing can occur with students bringing in information and ideas from outside experiences.
General Education: Intellectual Foundation
Critical Thinking
3-Year Trend Analysis: AY15-18

Prepared by Dr. Lynn A. Bruner

Presented by Dr. Troy Dermota
OAC Chair
## Student Learning Outcomes (SLO)

<table>
<thead>
<tr>
<th>Student Learning Outcomes (SLO)</th>
<th>AY15-16</th>
<th>AY16-17</th>
<th>AY17-18</th>
<th>3-Year Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 361</td>
<td>N = 263</td>
<td>N = 315</td>
<td>N = 929</td>
<td></td>
</tr>
<tr>
<td>A. Issue Identification AND determination of information (IL)</td>
<td>90%</td>
<td>86%</td>
<td>91%</td>
<td>89%</td>
</tr>
<tr>
<td>B. Selection of evidence and access to authoritative information (IL)</td>
<td>89%</td>
<td>89%</td>
<td>90%</td>
<td>89%</td>
</tr>
<tr>
<td>C. Consider alternative solutions or perspectives AND analyze the influence of assumptions, context, or bias</td>
<td>84%</td>
<td>82%</td>
<td>81%</td>
<td>82%</td>
</tr>
<tr>
<td>D. Assesses the logic of arguments, identifies fallacies committed AND responses to objections</td>
<td>82%</td>
<td>80%</td>
<td>85%</td>
<td>82%</td>
</tr>
<tr>
<td>E. Synthesis of ideas demonstrating insight AND reflective reasoning (IL)</td>
<td>81%</td>
<td>83%</td>
<td>81%</td>
<td>81%</td>
</tr>
<tr>
<td>OVERALL % Rated as Competent or Above</td>
<td>84%</td>
<td>95%</td>
<td>84%</td>
<td>87%</td>
</tr>
</tbody>
</table>
Some CT rubrics have N/A scores

- **Policy**
  - All five SLO’s are to be assessed in CT approved courses.
  - All SLO’s are mapped to the university approved syllabus for the course.

- **Challenge**
  - Applicability of the SLO language to some disciplines
  - Student deficits in basic skills confound assessment
  - Assessment of a single assignment may not be able to cover all SLO’s leading to N/A scores
    - Assessment of multiple assignments may be necessary to assess all five SLO’s
Actions and summary information

• Policy
  • An explanation of N/A must be included in the actions
  • Actions, course number, and course level are required for every rubric data set

• Challenges
  • Forgetfulness

  • Having department levels meets to determine actions
    • Starting in AY16-17, data is due to OAC the year after the data is included in department annual reports giving the needed time.
Recommendations

• Coordinators should include course number, department, semester, and actions on Excel spreadsheets sent to OAC.
  • Reminders from OAC as data is received

• Rubric training to assure that faculty have an assessment method that works for all outcomes
  • Talk to your assessment coordinator or OAC chair for assistance
Recommendations

- Consider the use of Portfolio software to track skills related general education areas
  - Student scores could be correlated to course level

- Determine if 100 level courses are appropriate for CT
  - Related to the observation that student deficits in basic skills confound assessment

- Discuss the language used in the CT rubric to determine if the rubric can be made more applicable across disciplines
CT course availability

Number of CT courses offered each semester

- FA15
- SP16
- FA16
- SP17
- FA17
- SP18
General Education Competency
Knowledge and Inquiry: Natural Sciences
Three Year Summary Report - AY15-18
Prepared and presented by
Dr. Troy Dermota
Department of Chemistry
OAC Chair
## % of students rating 2 or higher

<table>
<thead>
<tr>
<th>NS Rubric Objective</th>
<th>AY15-16</th>
<th>AY16-17</th>
<th>AY17-18</th>
<th>Three year overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Demonstrate knowledge of major principles and concepts</td>
<td>70%</td>
<td>76%</td>
<td>79%</td>
<td>75%</td>
</tr>
<tr>
<td>B. Explain natural phenomena or events and their impact on individual organisms, societies, or the world.</td>
<td>71%</td>
<td>81%</td>
<td>79%</td>
<td>77%</td>
</tr>
<tr>
<td>C. Demonstrate a conceptual understanding of the scientific method</td>
<td>63%</td>
<td>84%</td>
<td>91%</td>
<td>78%</td>
</tr>
<tr>
<td>D. Apply quantitative methods to solve problems</td>
<td>74%</td>
<td>79%</td>
<td>74%</td>
<td>76%</td>
</tr>
<tr>
<td>E. Apply scientific concepts to solve problems through laboratory investigation</td>
<td>80%</td>
<td>87%</td>
<td>89%</td>
<td>86%</td>
</tr>
<tr>
<td>F. Illustrate laboratory findings in numeric, graphic, or written form</td>
<td>79%</td>
<td>87%</td>
<td>83%</td>
<td>84%</td>
</tr>
<tr>
<td>Summary Median Scores of 2 or above (Competency)</td>
<td>75%</td>
<td>86%</td>
<td>86%</td>
<td>83%</td>
</tr>
</tbody>
</table>
Observations on method

- All departments offering NS reported data
- 1055/1571 samples or 67.4% are from lab courses
- Nearly all rubrics contain course information and actions
Observations on Actions

• For courses that are taught on a regular bases, the stated actions improved low objectives

• This result shows the value and effectiveness of assessment and the commitment by faculty to closing the loop by implementing actions the following years.
Observations on results

• Competencies are being met
• % competency is in an appropriate range
  • science faculty are upholding high standards of rigor

• Lab compared to non lab courses
  • Lab course had a higher competency rate then non lab courses for AY15-16 and AY16-17
  • For AY17-18, non lab courses had a higher competency rate.
NS course availability

Number of NS courses offered each semester

FA15  SP16  FA16  SP17  FA17  SP18