



# Assessment in Academic Departments: Getting Started, Using Findings, and Lessons Learned

## Part 1

Michael Pittari, M.F.A.

Lebanon Valley College  
Department of Art & Art History

Lebanon Valley College



## **Previous Assessment Model**

- primary evaluation based on ‘quality’ of work
- secondary evaluation based on student effort and growth

## **Flaws of Previous Assessment Model**

- lack of specific criteria in evaluating production of art
- lack of nuance in assigning grades

## **Challenges of Assessment at Small Liberal Arts College**

- limited course offerings, especially at capstone level
- limited contact hours and studio facilities
- less focused or unprepared students



## **New Assessment Model**

- evaluation based on specific criteria linked to learning objectives
- rubrics based on AACU and NASAD practices

## **Strengths of New Assessment Model**

- specific criteria in evaluating production of art
- clarity in assigning grades

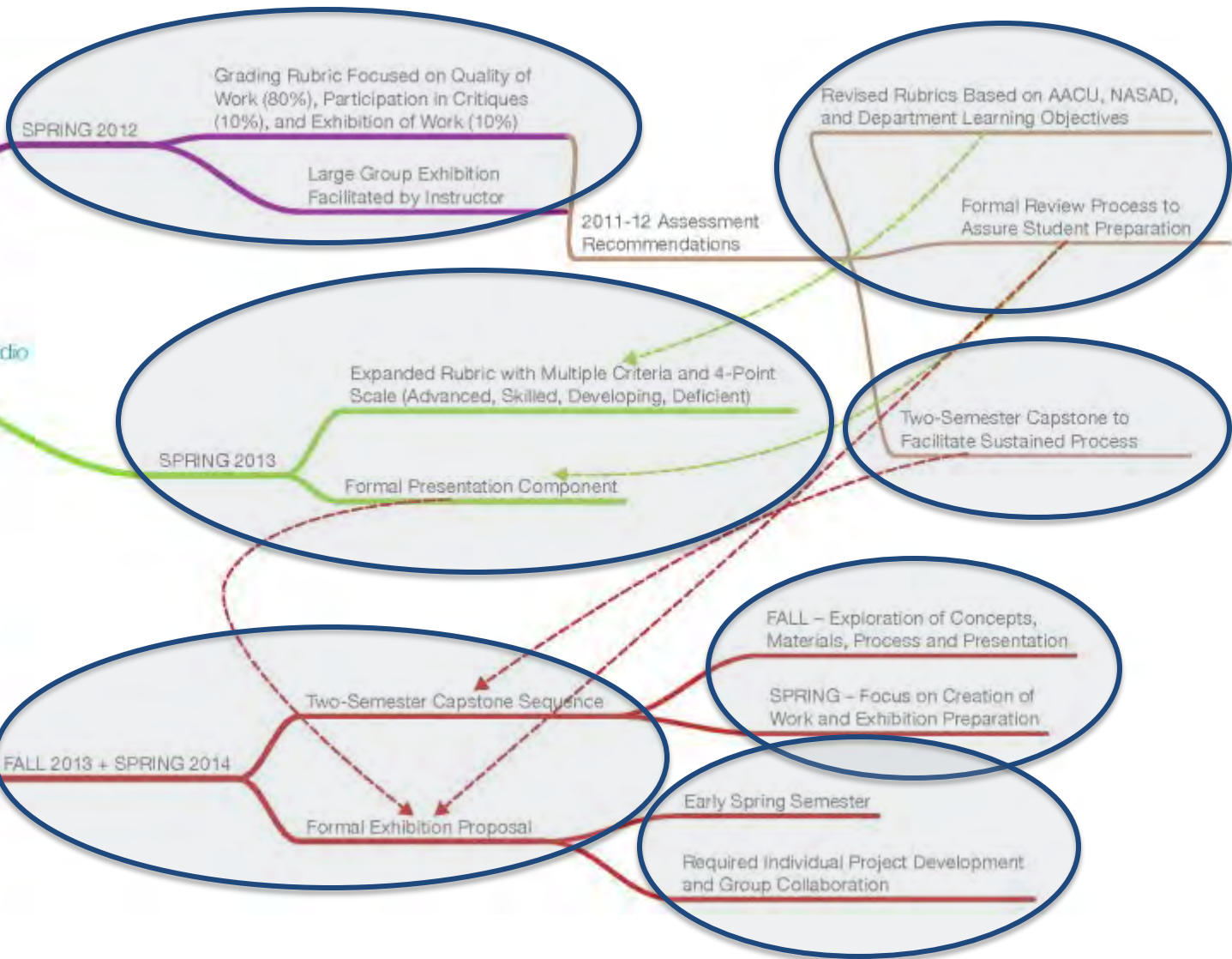
## **Opportunities for Assessment at Small Liberal Arts College**

- integrate multiple courses into capstone experience
- involve multiple faculty and undertake non-traditional projects
- incorporate learning from other disciplines



# Assessment in Visual Art: Three-Year Strategy

Assessment of ART 405: Advanced Studio  
Lebanon Valley College





# Assessment in Visual Art: Evaluation Rubric

CRITERIA	← PERFORMANCE LEVELS →			
	EXEMPLARY	PROFICIENT	DEVELOPING	BEGINNING
APPLY KNOWLEDGE	Student demonstrates understanding ability to independently select, develop, and refine themes and formats. Attitude towards work is imaginative, sophisticated, and rigorous.	Student demonstrates ability to select, develop, and refine themes and formats. Attitude towards work is imaginative and appropriately rigorous.	Student demonstrates ability - with assistance of professor - to select, develop, and refine themes and formats. Attitude towards work is somewhat imaginative but less rigorous.	Student has difficulty - even with assistance of professor - selecting, developing, and refining themes and formats. Attitude towards work may be unimaginative or lacking in rigor.
MAKE MEANINGFUL CONNECTIONS	Student incorporates meaningful connections to art history and other contexts (such as cultural, philosophical, or social), in attempting to enrich work and integrate a diverse range of critical perspectives.	Student seeks meaningful connections to art history and other contexts (such as cultural, philosophical, or social), in attempting to enrich work and integrate a diverse range of critical perspectives.	Student displays interest in - but may not initiate - connections to art history and other contexts (such as cultural, philosophical, or social), in attempting to enrich work and integrate a range of critical perspectives.	Student displays little interest or initiative in seeking connections to art history and other contexts (such as cultural, philosophical, or social).
CHALLENGE & EXPERIMENT WITH MEDIUM OR FORM	Student demonstrates a high level of intellectual curiosity, generates and considers multiple options; employs experimentation with medium or form, and is adventurous in finding solutions to challenges or problems of work.	Student demonstrates intellectual curiosity, generates and considers multiple options; employs experimentation with medium or form, and is flexible in finding solutions to challenges or problems of work.	Student demonstrates less intellectual curiosity, generates and considers several options; employs some experimentation with medium or form, and/or is less flexible in finding solutions to challenges or problems of work.	Student displays a lack of intellectual curiosity, generates and considers limited options; employs little experimentation with medium or form, and/or is inflexible in finding solutions to challenges or problems of work.
APPROACH & TECHNICAL SKILL	Student's work demonstrates a sophisticated approach to medium; is innovative and ambitious in scope; is constructed with a high degree of technical skill and/or refinement; and is presented in a professional manner.	Student's work demonstrates a competent approach to medium; is ambitious in scope; is constructed with some degree of technical skill and/or refinement; and is presented in a professional manner.	Student's work demonstrates an adequate approach to medium; is less innovative or ambitious in scope; is constructed with a less technical skill or refinement; and/or is presented in a less professional manner.	Student's work demonstrates an inadequate approach to medium; is unoriginal or unambitious; is technically flawed and/or unfinished, and/or is presented in a sloppy or casual manner.
CRITICAL ANALYSIS & REFLECTION	Student demonstrates a high level of engagement with the critique process, offering accurate, critical, and insightful comments to classmates. Introduces own work with clarity and openness.	Student demonstrates engagement with the critique process, offering accurate and helpful comments to classmates but avoiding critical input. Introduces own work with clarity and openness.	Student is less engaged and somewhat passive in the critique process, offering perfunctory or tangential comments to classmates. Introduces own work with a lesser degree of clarity and/or	Student is disengaged or passive in the critique process, offering few or no comments to classmates. May introduce own work with little clarity, with an overly casual approach, or with a defensive attitude.
<b>TOTAL SCORE =</b>				
<b>SCORE CALCULATION:</b>				
<b>TOTAL SCORE = NUMBER OF CRITERIA (5) × NUMERICAL SCORE (0-4) = POSSIBLE POINTS</b>				





# Assessment in Visual Art: Targets and Findings

≤ 3.0

≤ 3.0

≥ 3.0

≥ 3.0

≥ 3.0

CRITERIA ↓	← PERFORMANCE LEVELS →				
	1 - EMERGING	2 - FOUNDATIONAL	3 - DEVELOPING	4 - PROFICIENT	5 - EXPERT
<p><b>Visual Communication</b></p> <p>→</p>	Student demonstrates outstanding ability to independently select, develop, and refine themes and formats. Attitude towards work is imaginative, sophisticated, and rigorous.	Student demonstrates ability to independently select, develop, and refine themes and formats. Attitude towards work is imaginative and appropriately rigorous.	Student demonstrates ability - with assistance of professor - to select, develop, and refine themes and formats. Attitude towards work is somewhat imaginative but less rigorous.	Student has difficulty - even with assistance of professor - selecting, developing, and refining themes and formats. Attitude towards work may be unimaginative or lacking in rigor.	
<p><b>Art Historical Perspectives</b></p> <p>→</p>	Student incorporates meaningful connections to art history and other contexts (such as cultural, philosophical, or social), in attempting to enrich work and integrate a diverse range of critical perspectives.	Student seeks meaningful connections to art history and other contexts (such as cultural, philosophical, or social), in attempting to enrich work and integrate a diverse range of critical perspectives.	Student displays interest in - but may not initiate - connections to art history and other contexts (such as cultural, philosophical, or social), in attempting to enrich work and integrate a range of critical perspectives.	Student displays little interest or initiative in seeking connections to art history and other contexts (such as cultural, philosophical, or social).	
<p><b>Imagery &amp; Problem Solving</b></p> <p>→</p>	Student demonstrates a high level of intellectual curiosity, generates and considers multiple options; employs experimentation with medium or form, and is adventurous in finding solutions to challenges or problems of work.	Student demonstrates intellectual curiosity, generates and considers multiple options; employs experimentation with medium or form, and is flexible in finding solutions to challenges or problems of work.	Student demonstrates less intellectual curiosity, generates and considers several options; employs some experimentation with medium or form, and/or is less flexible in finding solutions to challenges or problems of work.	Student displays a lack of intellectual curiosity, generates and considers limited options; employs little experimentation with medium or form, and/or is inflexible in finding solutions to challenges or problems of work.	
<p><b>Formal &amp; Technical Skill</b></p> <p>→</p>	Student's work demonstrates a sophisticated approach to medium; is innovative and ambitious in scope; is constructed with a high degree of technical skill and/or refinement; and is presented in a professional manner.	Student's work demonstrates a competent approach to medium; is ambitious in scope; is constructed with some degree of technical skill and/or refinement; and is presented in a professional manner.	Student's work demonstrates an adequate approach to medium; is less innovative or ambitious in scope; is constructed with a less technical skill or refinement; and/or is presented in a less professional manner.	Student's work demonstrates an inadequate approach to medium; is unoriginal or unambitious; is technically flawed and/or unfinished, and/or is presented in a sloppy or casual manner.	
<p><b>Critical Analysis &amp; Reflection</b></p> <p>→</p>	Student demonstrates a high level of engagement with the critique process, offering accurate, critical, and insightful comments to classmates. Introduces own work with clarity and openness.	Student demonstrates engagement with the critique process, offering accurate and helpful comments to classmates but avoiding critical input. Introduces own work with clarity and openness.	Student is less engaged and somewhat passive in the critique process, offering perfunctory or tangential comments to classmates. Introduces own work with a lesser degree of clarity and/or openness.	Student is disengaged or passive in the critique process, offering few or no comments to classmates. May introduce own work with little clarity, with an overly casual approach, or with a defensive attitude.	
<b>TOTAL SCORE =</b>					
<b>SCORE CALCULATION</b>					
TOTAL SCORE = NUMBER OF CRITERIA (5) × NUMERICAL SCORE (0-5) = 0-25 POSSIBLE POINTS					



### **Identifying Problem Areas in Curriculum**

- certain evaluation criteria below target
- range of assessments needed

### **Improving Problem Areas in Curriculum**

- emphasize criteria in course objectives
- distribute assessments throughout capstone experience
- structural changes to course sequencing and contact hours

### **Building on Assessment to Improve Program**

- distinctive attributes of visual art at SLAC
- visual art as research-based practice
- partnering with academic departments



# Assessment in Academic Departments: Getting Started, Using Findings, and Lessons Learned

## Part 2

Walter Patton, Ph.D.

Lebanon Valley College  
Department of Chemistry  
Program in Biochemistry & Molecular

Lebanon Valley College





## Assessment in Science: A variety of approaches

### **Classic rubrics**

Formative & Summative Assessments

- Use for a course and/or a program
- Home-grown, AAC&U or Adapted from AAC&U

### **Standardized Exams**

Used throughout our curriculum

- ACS Exams
- ETS-MFAT

### **Student Self-assessment**

Summer Research Program

- SURE III Survey



# Rubrics: Assess your course and program.

## BCMB Program Assessment 2013-2014

### Objective 2a Problem Solving

Level = Capstone

Assessment was performed during Spring 2014

Assessment was performed by W. Patton

BCMB 422 Hourly Exam Question

Outcomes were evaluated using the AAC&U Effective Problem Solving Rubric

5 BCMB students were evaluated; all were seniors

Major*	Define Problem	Identify Strategies	Propose Solutions/Hypotheses	Evaluate Potential Solutions	Implement Solutions	Evaluate Outcomes	Average Score
Bcmb	3	3	3	3	3	3	3.0
Bcmb	4	3	4	4	4	4	3.8
Bcmb	2	3	3	2	3	3	2.7
Bcmb	4	4	4	4	4	4	4.0
Bcmb	4	3	3	3	3	4	3.3
<b>Average Score</b>	<b>3.4</b>	<b>3.2</b>	<b>3.4</b>	<b>3.2</b>	<b>3.4</b>	<b>3.6</b>	
Bio	3	3	4	3	3	3	3.2
Bio	4	4	4	4	4	4	4.0
Bio	3	3	3	3	3	3	3.0
Bio	4	4	4	3	3	3	3.5
Bio	3	2	3	2	2	3	2.5
Bio	3	3	4	3	3	3	3.2
<b>Average Score</b>	<b>3.3</b>	<b>3.2</b>	<b>3.7</b>	<b>3.0</b>	<b>3.0</b>	<b>3.2</b>	

Bcmb  
3.4

Bio  
3.2

Needed: Not only a good rubric, but also good details about its use.

#### Description of Activity and Assessment

A single question was embedded into a BCMB 422 hourly exam. The question was evaluated according to the following application of the rubric: A score of 4 was given to a level of mastery expected by a senior BCMB major.

#### Activity/ Question/ Problem Assessed

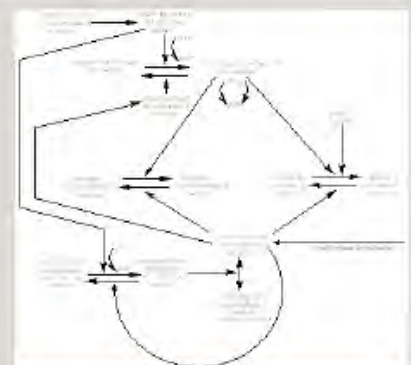
Consider the regulatory pathway for glycogen synthesis and degradation on the right. We have not discussed the details of the interaction of insulin with this pathway, but what would you predict are the effects of insulin from what I have shown? Give specific examples of two steps affected.

#### Target & Rational

A score of at least 3 or greater in each area (defined by the rubric) is consistent with a level of understanding for a rising senior. A score of 4 would indicate a mastery of each area and is consistent with a level of understanding desired for a graduating BCMB major.

#### Results

BCMB students at the capstone level are, on average, meeting the target for this assessment. Meeting the target is consistent with mastery of problem-solving skills.





# Standardized Exams: ETS MFAT in Chemistry

## Summary Sheet of ETS Major Field Test in Chemistry for LVC 2015 Graduating Seniors

Name	Individual Scaled Scores - Exam 4HMF					BCHM	Critical Thinking	Individual Percentile Scores					BCHM	Critical Thinking
	Physical	Organic	Inorganic	Analytical	Total			Physical	Organic	Inorganic	Analytical	Total		
	85	86	76	81	186			99%	100%	97%	99%	99%		
	74	73	72	69	174			95%	95%	94%	92%	96%		
	74	81	82	89	184			95%	99%	99%	100%	99%		
	51	39	59	50	149			57%	25%	76%	54%	52%		
	54	37	46	54	144			65%	21%	43%	65%	39%		
	70	34	56	60	153			92%	16%	69%	79%	62%		
	58	42	46	60	148			74%	32%	43%	79%	49%		
Cohort Mean	66.6	56.0	62.4	66.1	162.6	56.0	62.0							
STDEV	12.5	22.9	14.4	14.3	18.1									
EXAM 4HMF National Data for 5105 Examinees (9/2011- 6/2015)														
NAT Mean	48.3	48.6	48.5	48.4	148.3									
NAT STDEV	15.2	14.5	14.9	14.6	14.8									
EXAM 4HMF National Data for 191 Institutions (9/2011 - 6/2015)														
NAT Inst. Mean	48.4	48	48.6	48.4	148.1	48.4	45.3	LVC Cohort versus Cohorts from 90 Other Institutions						
NAT STDEV	9.3	8.8	9.1	8.8	9.6	9.3	10.8	97%	82%	94%	98%	93%	79%	94%
								Physical	Organic	Inorganic	Analytical	Total	BCHM	CRIT

Z scores	Physical	Organic	Inorganic	Analytical	Total	BCHM	Thinking
0	2.4145	2.5793	1.8456	2.2329	2.5473		
0	1.6908	1.6828	1.5772	1.4110	1.7365		
0	1.6908	2.2345	2.2483	2.7808	2.4122		
0	0.1776	-0.6621	0.7047	0.1096	0.0473		
0	0.3750	-0.8000	-0.1678	0.3836	-0.2905		
0	1.4276	-1.0069	0.5034	0.7945	0.3176		
0	0.6382	-0.4552	-0.1678	0.7945	-0.0203		
As Individuals	1.202	0.510	0.935	1.215	0.964		
LVC Institution	1.954	0.909	1.520	2.016	1.507	0.817	1.546

- How do your students compare to others?
- We are lucky to have instruments such as this.



## Standardized Exams: ACS Exams

### Course-level Exams

Used as a final exam in:

Gen Chem I & II

Organic II

P-chem I & II

Biochem II

We made an investment in data collection software.



915-358301 Spring 2014 BCMB 422 Final Exam

First five letters of your last name

Initial of your first name.

Middle Initial

1						26						51					
2						27						52					
3						28						53					
4						29						54					

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# ACS Exams: What do we get out of the data?

**American Chemical Society  
Division of Chemical Education**

**Composite Norms**

**Second Term General Chemistry Exam 2010**

Score	Percentile	Score	Percentile	Score	Percentile
70	100	46	80	22	8
69	100	45	78	21	6
68	100	44	76	20	5
67	100	43	74	19	4
66	100	42	71	18	2
65	100	41	68	17	2
64	100	40	65	16	1
63	99	39	63	15	1
62	99	38	60	14	0
61	99	37	56	13	0
60	98	36	53	12	0
59	98	35	49	11	0
58	97	34	46	10	0
57	96	33	42	9	0
56	95	32	39	8	0
55	94	31	35	7	0
54	93	30	31	6	0
53	92	29	28	5	0
52	91	28	24	4	0
51	90	27	21	3	0
50	88	26	18	2	0
49	86	25	16	1	0
48	85	24	13		
47	83	23	11		



Section	Raw Score	z score	%tile
1	38	0.168	57
1	29	-0.669	25
1	37	0.075	53
1	30	-0.576	28
1	39	0.261	60
1	34	-0.204	42
1	35	-0.111	46
1	45	0.820	79
1	40	0.354	64
1	40	0.354	64
1	47	1.006	84
1	34	-0.204	42
1	26	-0.948	17
1	30	-0.576	28
1	20	-1.506	7
1	24	-1.134	13
1	44	0.727	77
1	28	-0.762	22
1	42	0.540	71

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# ACS Gen Chem I: Items on which we do well...

**Table 2 Analysis of CHM 111 ACS Exam Data**

Numbers below are percentages of students answering the question correctly.

Question Area	N = Question	68	70	35	173 Total	National AVG	Δ from National AVG	LVC AVG	Δ from National AVG	Question Area	Individual Question
a	1	25.0	32.9	34.3	<b>30.1</b>	32.0	<b>-1.9</b>				What is in gas when compound boils
a	2	69.1	87.1	80.0	<b>78.6</b>	64.0	<b>14.6</b>				
a	3	50.0	75.7	54.3	<b>61.3</b>	54.0	<b>7.3</b>				
a	13	58.8	71.4	60.0	<b>64.2</b>	45.0	<b>19.2</b>				
a	14	61.8	78.6	80.0	<b>72.3</b>	52.0	<b>20.3</b>	61.3	11.9	a. General/Physical Properties	Oxidation number of carbon

Question Area	N = Question	68	70	35	173 Total	National AVG	Δ from National AVG	LVC AVG
a	1	25.0	32.9	34.3	<b>30.1</b>	32.0	<b>-1.9</b>	
a	2	69.1	87.1	80.0	<b>78.6</b>	64.0	<b>14.6</b>	
a	3	50.0	75.7	54.3	<b>61.3</b>	54.0	<b>7.3</b>	
a	13	58.8	71.4	60.0	<b>64.2</b>	45.0	<b>19.2</b>	
a	14	61.8	78.6	80.0	<b>72.3</b>	52.0	<b>20.3</b>	61.3
b	4	36.8	45.7	45.7	<b>42.2</b>	56.0	<b>-13.8</b>	
b	6	39.7	50.0	42.9	<b>44.5</b>	21.0	<b>23.5</b>	
b	69	47.1	62.9	51.4	<b>54.3</b>	60.0	<b>-5.7</b>	
b	70	58.8	74.3	77.1	<b>68.8</b>	55.0	<b>13.8</b>	52.5

g	27	73.5	84.3	97.1	<b>82.7</b>	59.0	<b>23.7</b>				Calculate g from M and volume
g	28	27.9	41.4	25.7	<b>32.9</b>	32.0	<b>0.9</b>				
g	30	52.9	65.7	57.1	<b>59.0</b>	49.0	<b>10.0</b>				
g	31	66.2	78.6	60.0	<b>69.9</b>	63.0	<b>6.9</b>	60.3	11.7	g. Moles, Molarity, Solutions	
h	32	70.6	65.7	71.4	<b>68.8</b>	56.0	<b>12.8</b>				
h	33	50.0	55.7	60.0	<b>54.3</b>	54.0	<b>0.3</b>				
h	34	72.1	72.9	80.0	<b>74.0</b>	58.0	<b>16.0</b>				
h	35	60.0	60.0	74.3	<b>74.4</b>	57.0	<b>17.4</b>				



# ACS Gen Chem I: Items on which we do less well...

e	29	39.7	62.9	45.7	<b>50.3</b>	33.0	<b>17.3</b>	66.6	18.9	e. Stoichiometry	
g	21	51.5	64.3	54.3	<b>57.2</b>	40.0	<b>17.2</b>				
g	27	73.5	84.3	97.1	<b>82.7</b>	59.0	<b>23.7</b>				Calculate g from M and volume
g	28	27.9	41.4	25.7	<b>32.9</b>	32.0	<b>0.9</b>				
g	30	52.9	65.7	57.1	<b>59.0</b>	49.0	<b>10.0</b>				
g	31	66.2	78.6	60.0	<b>69.9</b>	63.0	<b>6.9</b>	60.3	11.7	g. Moles, Molarity, Solutions	
h	32	70.6	65.7	71.4	<b>68.8</b>	56.0	<b>12.8</b>				
h	33	50.0	55.7	60.0	<b>54.3</b>	54.0	<b>0.3</b>				
h	34	72.1	72.9	80.0	<b>74.0</b>	58.0	<b>16.0</b>				
i	37		39.7	57.1	37.1	<b>46.2</b>	26.0				
i	38		30.9	55.7	31.4	<b>41.0</b>	70.0				Calculate $\Delta H$ reaction from other $\Delta H$ of reaction
i	39		19.1	18.6	25.7	<b>20.2</b>	66.0				Use bond enthalpies to calculate $\Delta H$ reaction Which has $\Delta H^\circ = 0$
i	40		33.8	34.3	40.0	<b>35.3</b>	41.0				Potential Energy Diagram
i	41		83.8	88.6	71.4	<b>83.2</b>	51.0				Identify endothermic phase change
i	42		63.2	72.9	65.7	<b>67.6</b>	47.0				Electronic configuration
i	43		33.8	44.3	31.4	<b>37.6</b>	57.0				Electronic configuration
i	44		64.7	68.6	60.0	<b>65.3</b>	43.0				Energy of photon from wavelength
i	45		92.6	94.3	91.4	<b>93.1</b>	84.0				Quantum numbers n and l
k	61	64.7	62.9	65.7	<b>64.2</b>	43.0	<b>21.2</b>				Sigma and pi bonds in Lewis Structure
k	62	47.1	80.0	60.0	<b>63.0</b>	43.0	<b>20.0</b>				
k	63	50.0	57.1	42.9	<b>51.4</b>	67.0	<b>-15.6</b>				
k	65	42.6	47.1	45.7	<b>45.1</b>	52.0	<b>-6.9</b>				
k	66	63.2	85.7	91.4	<b>78.0</b>	59.0	<b>19.0</b>				Hybridization from Lewis Structure
k	67	73.5	77.1	71.4	<b>74.6</b>	53.0	<b>21.6</b>				Formal Charge from Lewis Structure
k	68	29.4	45.7	37.1	<b>37.6</b>	73.0	<b>-35.4</b>	56.1	2.8	k. Lewis Structures, Hybridization, Molecular Shape	Resonance structure and bond length
l	51	45.6	47.1	45.7	<b>46.2</b>	76.0	<b>-29.8</b>				Atomic radius and ionization energy
l	52	54.4	78.6	51.4	<b>63.6</b>	81.0	<b>-17.4</b>				Paramagnetic in ground state
l	53	45.6	70.0	65.7	<b>59.5</b>	46.0	<b>13.5</b>				
l	54	36.8	35.7	25.7	<b>34.1</b>	39.0	<b>-4.9</b>				Electronegativity
l	55	73.5	74.3	74.3	<b>74.0</b>	69.0	<b>5.0</b>				Atomic radius
l	56	80.9	88.6	80.0	<b>83.8</b>	58.0	<b>25.8</b>				Metals, nonmetals, liquids, gases, solids
l	57	60.3	68.6	60.0	<b>63.6</b>	56.0	<b>7.6</b>				
l	58	69.1	85.7	68.6	<b>75.7</b>	31.0	<b>44.7</b>				Does not exist as diatomic molecule
l	64	61.8	80.0	65.7	<b>69.9</b>	40.0	<b>29.9</b>	63.4	8.3	l. Periodic Properties	Identify covalent compound



# Student Self-assessment: SURE III Survey

Summer Research Program

Do we need to look at this program?

Our students do well.

Most on that list have done research.

CHM	PhD Program, Physical Chemistry, University of Pittsburgh, Pittsburgh, Pa.
BCMB	Master in Biomedical Sciences, Robert Wood Johnson Medical School, Rutgers University, Newark, NJ
BCMB	Medical Student, Temple University School of Podiatric Medicine, Philadelphia, Pa.
BCMB	Quality Control/R&D Chemist, Cargill Incorporated, Lititz, Pa.
BCMB	MS Program in Animal Science, North Carolina State University, Raleigh, NC
CHM	Chemist, Ashwin-Ushas Corporation, Marlboro, New Jersey.
BCMB	Postbaccalaureate IRTA Fellowship, National Institutes of Health, Bethesda, Md.
CHM	Biomaterials Research and Development, Kensey Nash Corporation, Exton, Pa.
CHM	PhD Program, Inorganic Chemistry, University of Florida, Gainesville, FL
BCMB	Ph.D. Program in Genetics; Penn State University, College Park, Pa.
CHM	Ph.D. Program, Analytical Chemistry, University of Delaware, Newark, Del.
BCMB	PhD Program, Biochemistry and Molecular Pharmacology, Thomas Jefferson University, Philadelphia, Pa.
BCMB	PhD Program, Neuropharmacology, Duquesne University, Pittsburgh, Pa.



# Student Self-assessment: SURE III Survey

2013 SURE III Survey Data Summary			
LVC	National	Difference	Possible Learning Gain
3.2	3.1	0.1	Clarification of a Career Path
3.8	3.6	0.3	Skill in Interpretation of Results
3.7	3.8	-0.1	Learn Tolerance for Obstacles in Research
3.8	3.7	0.0	Readiness for More Demanding Research
3.5	3.5	0.0	Understanding How Knowledge is Constructed
3.4	3.8	-0.4	Understanding the Research Process
3.5	3.5	0.0	Ability to Integrate Theory and Practice
3.6	3.7	-0.1	Understanding How Scientist Work on Real Problems
3.7	3.3	0.4	Understanding that Assertions Require Evidence
4.0	3.6	0.5	Ability to Analyze Data
3.8	3.3	0.5	Understanding Science
3.3	3.0	0.3	Learning Ethical Conduct in Science
4.1	3.7	0.4	Learning Laboratory Techniques
3.5	3.5	0.0	Ability to Read and Understand Primary Literature
3.6	3.1	0.5	Skill in How to Give an Effective Oral Presentation
2.6	2.9	-0.3	Skill in Science Writing
3.7	3.3	0.4	Self Confidence
3.5	3.3	0.2	Understanding How Scientists Think
3.5	3.6	-0.1	Learning to Work Independently
3.9	3.4	0.5	Becoming Part of a Learning Community
3.2	3.0	0.2	Confidence in my Potential as a Teacher

Chemistry Dept.  
Learning objective

Survey of  
Undergraduate  
Research  
Experiences

3.2  
3.1  
3.1, 3.2, 4.1  
1.2, 3.1

David Lopatto

3.1, 3.2, 5.1  
1.2, 2.2  
2.1, 3.1, 4.1

Center for  
Teaching,  
Learning, &  
Assessment

3.1  
3.2  
1.1, 1.2, 5.1  
4.1, 4.2  
2.1, 2.2

(Grinnell College;  
HHMI Funding)

4.2  
5.1  
5.1  
5.1  
3.1, 3.2, 4.1

5.1  
5.1



# Student Self-assessment: SURE III Survey

We noted some changes in the data...

2014 SURE III Survey Data Summary				Chemistry Dept. Learning objective
LVC	National	Difference	Possible Learning Gain	
3.3	3.2	0.1	Clarification of a Career Path	
3.8	3.6	0.2	Skill in Interpretation of Results	3.2
<b>4.1</b>	3.9	0.3	Learn Tolerance for Obstacles in Research	3.1
3.8	3.8	0.0	Readiness for More Demanding Research	3.1, 3.2, 4.1
3.6	3.6	0.0	Understanding How Knowledge is Constructed	1.2, 3.1
<b>3.8</b>	<b>3.9</b>	<b>-0.1</b>	<b>Understanding the Research Process</b>	<b>3.1, 3.2, 5.1</b>
3.5	3.6	0.0	Ability to Integrate Theory and Practice	1.2, 2.2
3.8	3.8	0.0	Understanding How Scientist Work on Real Problems	2.1, 3.1, 4.1
3.6	3.5	0.2	Understanding that Assertions Require Evidence	3.1
3.9	3.7	0.2	Ability to Analyze Data	3.2
3.9	3.5	<b>0.4</b>	Understanding Science	<b>1.1, 1.2, 5.1</b>
3.4	3.2	0.2	Learning Ethical Conduct in Science	4.1, 4.2
<b>4.1</b>	3.7	<b>0.4</b>	Learning Laboratory Techniques	<b>2.1, 2.2</b>
3.9	3.6	<b>0.3</b>	Ability to Read and Understand Primary Literature	<b>4.2</b>
3.6	3.3	0.3	Skill in How to Give an Effective Oral Presentation	5.1
<b>2.9</b>	<b>3.1</b>	<b>-0.2</b>	<b>Skill in Science Writing</b>	<b>5.1</b>
3.7	3.5	0.3	Self Confidence	5.1
3.6	3.5	0.2	Understanding How Scientists Think	3.1, 3.2, 4.1
3.9	3.7	0.2	Learning to Work Independently	
3.5	3.5	0.0	Becoming Part of a Learning Community	5.1
3.5	3.1	<b>0.4</b>	Confidence in my Potential as a Teacher	5.1

[Here is the change we made to our program.](#)





# How did we change summer research?

## Coffee

### LVC Summer Research Coffee Hour

Community...  
Discussion...  
Enrichment

#### ▼ Coffee Hour 2015

[2015 Schedule](#)  
[2015-05-26](#)  
[2015-06-02](#)  
[2015-06-09](#)  
[2015-06-16](#)  
[2015-06-23](#)  
[2015-06-30](#)  
[2015-07-07](#)  
[2015-07-14](#)  
[2015-07-21](#)  
[2015-Research Groups](#)

#### ▼ Professional Resources

[1\) Literature & Databases](#)  
[2\) Chemical Drawing Tools](#)  
[3\) Molecular Visualization Tools](#)  
[4\) Posters](#)  
[5\) Grad School](#)

#### ▼ Safety

[1\) Safety Agreement](#)  
[2\) MSDS On-line](#)  
[3\) Hazard Labeling](#)

### Community... Discussion... Enrichment

Countless research groups around the world, meet regularly to discuss science, learn from each other and advance the science they do every day. Research groups here at LVC do the same thing. In 2011, all of the summer research groups in the sciences at LVC began to meet once a week during the summer to learn from each other: to learn about the science being done and how all of us, students and faculty alike, can become good researchers, generating new knowledge in science. Here is a list of skills you should develop as a professional scientist. We hope that Coffee Hour helps you in that development.

<http://tinyurl.com/LVCCoffeeHour>

*(Continually being developed & edited by W. Patton - LVC Chemistry)*

#### As a scientist, you will need to:

- **conduct experiments in an informed and responsible manner.** Learn what you are working with, understand why you are conducting an experiment and work in a safe manner.
- **be literate in science.** Regularly read about happenings in the vast world of science, read about happenings in your specific discipline and read things that pertain to your own work.
- **build and maintain your professional tool kit.** Create and maintain resume', assemble a talk or poster on your current and past work.
- **commit yourself to becoming a life-long learner.** Read, go to talks [always have a notebook with you and take notes], learn from others...talk to people about what they do, not just when you need something.
- **be resourceful and be creative.** Watch what others do...learn from and imitate the good; learn from and don't repeat the bad. Develop an eye for those things that are common sense, thoughtful, are beyond to the obvious and downright cool. Appreciate and learn about what you see in the world around you...so many wonderful and useful things are adapted from what we see in nature.
- **document your work carefully and accurately.** You want to make sure that you know what you did so you (and others) can repeat it. Your notes can be/ can contain legally important information.
- **communicate science.** You will do this in written and oral forms. Some time you will be communicating to your peers, other times to more general audiences. You will need to write papers, prepare and present posters, give research presentations and lectures. Simply stated, your task is to be direct, concise and precise.
- **ask questions.** In planning what experiments to do and how to do them, you are asking questions. By performing



## Summary – We use a variety of approaches.

We use a variety of approaches to assessment.

We value measuring our students against others, at the national level.

Consider assessing something even if that something looks good to you.

THANK YOU!

Lebanon Valley College



# Assessment in Academic Departments: Getting Started, Using Findings, and Lessons Learned

## Part 3

Marianne Goodfellow, Ph.D.  
Sociology and Criminal Justice

Lebanon Valley College



## Adopt AAC&U Core Competencies

Shift from assessment of goals and objectives to AAC&U core competencies:

- Inquiry and analysis
- Intercultural knowledge and competence
- Information literacy
- Ethical reasoning
- Teamwork
- Quantitative literacy
- Communication skills—both oral and written; and
- Civic Engagement



# Create a reasonable cycle of assessment

## Cycle of Assessment (3 yr)

### Transition to Core Competencies 2012-2013

2010-2011	2011-2012	2012-13	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
Sociological Imagination	Sociological Imagination	Information Literacy	Teamwork	Inquiry & Analysis	Quantitative Literacy	Information Literacy	Teamwork	Inquiry and Analysis
	Basic Knowledge	Critical Thinking	Oral Communication		Intercultural knowledge & Competence	Critical Thinking	Oral Communication	
	Critical Reading	Integrative Learning	Written Communication		Civic Engagement	Critical Reasoning	Written Communication	
	Diversity	Ethical Reasoning						





## Curriculum Map for each competency

Curriculum Map – Scaffold Signature Inquiry and Analysis Assignment and Assess for Value-Added Learning		
	Courses	Inquiry & Analysis
Req.	SOC 110	I = Introduce
Select 200-level	SOC 230	R = Reinforce
Req.	SOC 321/333 SOC 311	R = Reinforce R = Reinforce
Req.	SOC 499	M = Master



# AAC&U rubric

## INQUIRY AND ANALYSIS VALUE RUBRIC

*for more information, please contact [rubric@lvc.edu](mailto:rubric@lvc.edu)*



### Definition

Inquiry is a systematic process of exploring issues/objects/works through the collection and analysis of evidence that result in informed conclusions/judgments. Analysis is the process of breaking complex topics or issues into parts to gain a better understanding of them.

*Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (full one) level performance.*

	Capstone 4	Milestones 3 2		Benchmark 1
<b>Topic selection</b>	Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.	Identifies a focused and manageable/double topic that appropriately addresses relevant aspects of the topic.	Identifies a topic that, while manageable/double, is too narrowly focused and leaves out relevant aspects of the topic.	Identifies a topic that is far too general and wide-ranging as to be manageable and double.
<b>Existing Knowledge, Research, and/or Views</b>	Synthesizes in-depth information from relevant sources representing various points of view/approaches.	Presents in-depth information from relevant sources representing various points of view/approaches.	Presents information from relevant sources representing limited points of view/approaches.	Presents information from irrelevant sources representing limited points of view/approaches.
<b>Design Process</b>	All elements of the methodology or theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant subdisciplines.	Critical elements of the methodology or theoretical framework are appropriately developed, however, more subtle elements are ignored or unaccounted for.	Critical elements of the methodology or theoretical framework are missing, incompletely developed, or unfocused.	Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.
<b>Analysis</b>	Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.	Organizes evidence to reveal important patterns, differences, or similarities related to focus.	Organizes evidence, but the organization is not effective in revealing important patterns, differences, or similarities.	Lists evidence, but it is not organized and/or is unrelated to focus.
<b>Conclusions</b>	States a conclusion that is a logical extrapolation from the inquiry findings.	States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.	States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.	States an ambiguous, illogical, or unsupported conclusion from inquiry findings.
<b>Limitations and Implications</b>	Insightfully discusses in detail relevant and supported limitations and implications.	Discusses relevant and supported limitations and implications.	Presents relevant and supported limitations and implications.	Presents limitations and implications, but they are possibly irrelevant and unsupported.



# Develop customized rubric

Name:

4=Excellent/Very good

3=Good

2=Fair

1=Poor

0=Not completed

	<u>Content</u>	4	3	2	1	0
10	The abstract summarizes the relevance of the study, the methodology, and key findings.	10	8	6	4	0
50	30 The literature review establishes the importance of the research problem, informs the reader on what is known and not known about the problem, and establishes the need for research. Research cited is relevant.	30	25	20	15	0
	10 The literature review integrates theory.	10	8	6	4	0
	10 The literature review concludes with a statement of the specific research hypothesis or research questions.	10	8	6	4	0
40	20 The method section describes participants.	20	15	10	5	0
	20 The method section describes instrumentation (measurement).	20	15	10	5	0
20	The results section provides statistics clearly presented in tables and key relevant results are incorporated in text	20	15	10	5	0
20	5 The discussion section summarizes methods and results.	5	4	3	2	0
	5 The discussion section connects results with research questions and or/hypotheses (i.e. confirms or rejects the null hypothesis)	5	4	3	2	0
	10 The discussion section summarizes limitations of research, implications, and suggested directions of future research.	10	8	6	4	0
10	Tables and Figures enhance meaning	10	8	6	4	0

- Rubric for Soc 311 Research Methods in Sociology
- Writing Process Course- 3,000 words with feedback
- Paper worth 150 points
- Three drafts
- Reminder: Course to reinforce skill: in truth often the first empirical work



# Sample of Student Feedback

**Soc 311**  
**Name: Jane Doe**  
**Grade: 111/C**  
**4=Excellent/Very good**  
**3=Good**  
**2=Fair**  
**1=Poor**  
**0=Not completed**

	<u>Content</u>	4	3	2	1	0	
<b>10</b>	The abstract summarizes the relevance of the study, the methodology, and key findings.	10	8	6	4	0	
<b>50</b>	The literature review establishes the importance of the research problem, informs the reader on what is known and not known about the problem, and establishes the need for research. Research cited is relevant.	30	25	20	15	0	Still repetition sentences
	The literature review integrates theory.	10	8	6	4	0	
	The literature review concludes with a statement of the specific research hypothesis or research questions.	10	8	6	4	0	
<b>40</b>	The method section describes participants.	20	15	10	5	0	Little/no descriptor
	The method section describes instrumentation (measurement).	20	15	10	5	0	
<b>20</b>	The results section provides statistics clearly presented in tables and key relevant results are incorporated in text	20	15	10	5	0	
<b>20</b>	The discussion section summarizes methods and results.	5	4	3	2	0	
	The discussion section connects results with research questions and or/hypotheses (i.e. confirms or rejects the null hypothesis)	5	4	3	2	0	
	The discussion section summarizes limitations of research, implications, and suggested directions of future research.	10	8	6	4	0	
<b>10</b>	Tables and Figures enhance meaning	10	8	6	4	0	

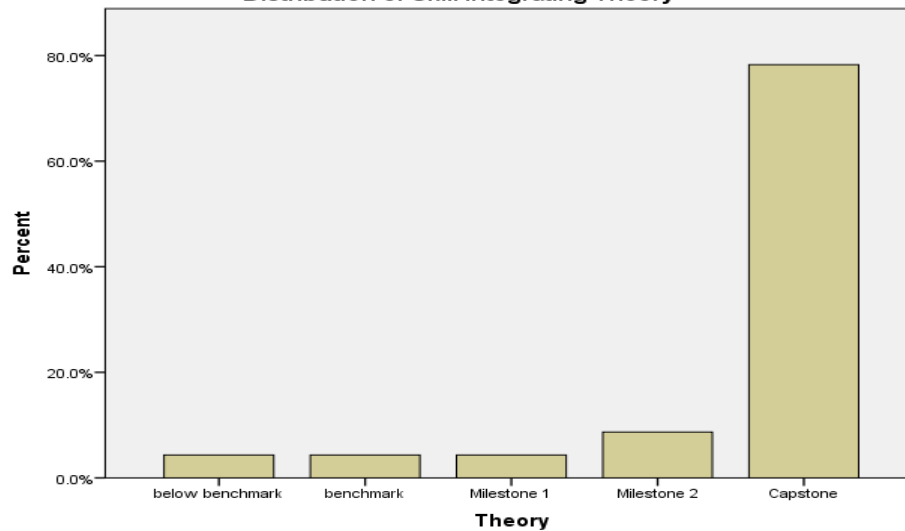


# Sample of Assessment Data

**Theory**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid below benchmark	1	4.3	4.3	4.3
benchmark	1	4.3	4.3	8.7
Milestone 1	1	4.3	4.3	13.0
Milestone 2	2	8.7	8.7	21.7
Capstone	18	78.3	78.3	100.0
Total	23	100.0	100.0	

**Distribution of Skill Integrating Theory**



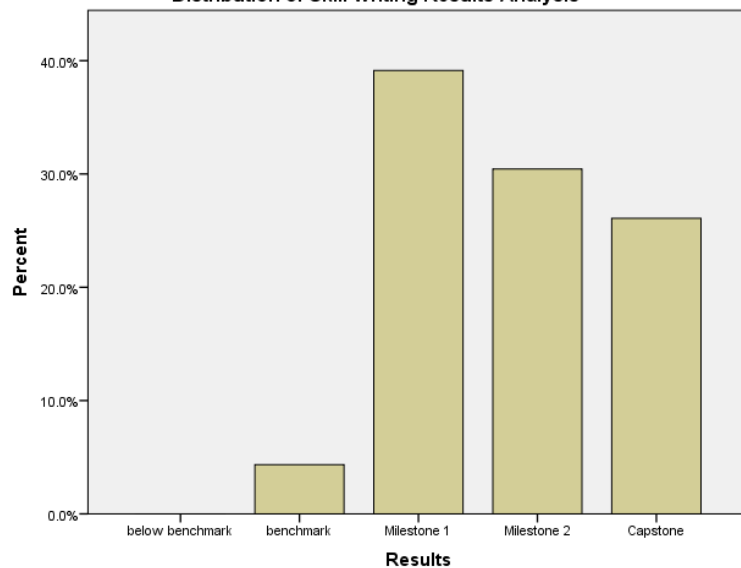


# Sample of Assessment Data

## Results

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	benchmark	1	4.3	4.3	4.3
	Milestone 1	9	39.1	39.1	43.5
	Milestone 2	7	30.4	30.4	73.9
	Capstone	6	26.1	26.1	100.0
	Total	23	100.0	100.0	

Distribution of Skill Writing Results-Analysis







## Summary

- Adopt AAC&U Core Competencies
- Use AAC&U Value Rubrics
- Modify AAC&U rubrics to meet specific needs
- Use rubrics for BOTH student feedback and grading AND department assessment