



EDUCATIONAL PROGRAMS

The Big Five: Addressing Core Competencies

May 19-20, 2015

Chaminade University, Honolulu, HI

Resource Binder

MARK YOUR CALENDARS 2015-2016

WASC Senior College and University Commission is pleased to announce a selection of educational programs for 2015-16. Developed by regional and national experts, they cover topics of vital interest to all higher educational institutions – and particularly to those in the WSCUC region. They are entirely optional, but our hope is that member institutions will find them of service. WSCUC staff will be present at each session to answer any questions related specifically to WSCUC accreditation expectations.

- ★ **Meaning, Quality, and Integrity of Degrees: Exploring Approaches, Models, & Tools**
October 9, 2015. Mills College, Oakland, CA
- ★ **Developing an Institutional Culture for Students' Success**
October 22, 2015. WSCUC Offices, Alameda, CA
- ★ **Assessment 101: The Assessment Cycle, Clear and Simple**
October 23, 2015. Mills College, Oakland, CA
- ★ **Assessment 201: Advanced Topics in Assessment**
November 18, 2015. Kellogg West, Pomona, CA
- ★ **The Big Five: Addressing The Five Core Competencies (2-day Retreat)**
November 19-20, 2015. Kellogg West, Pomona, CA
- ★ **President/Trustee Retreats**
December 3, 2015. Woodbury University, Burbank, CA
December 4, 2015. Mills College, Oakland, CA
- ★ **Assessment 201: Advanced Topics in Assessment**
February 5, 2016. Chaminade University, Honolulu, Hawai'i
- ★ **Developing an Institutional Culture for Students' Success**
May 5, 2016. Mills College, Oakland, CA
- ★ **Assessment 101: The Assessment Cycle, Clear and Simple**
May 6, 2016. Mills College, Oakland, CA

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THE BIG 5: ADDRESSING CORE COMPETENCIES

May 19-20, 2015

Chaminade University - Honolulu, HI

DAY 1

- 8 – 8:30 Registration
- 8:30 – 8:45 **Welcome:** Workshop Overview and Introduction of Facilitators (Melanie Booth, WSCUC)
- 8:45–9:30 **WSCUC Expectations** and a Framework for Approaching the Five Core Competencies (Melanie Booth, WSCUC)
- 9:30 – 10:00 **Workshop Strategy Session:** Institutional Self-Assessment & Workshop Plan (Melanie Booth, WSCUC)
- 10:00 Break and sign-up for office hour appointments

“BIG 5” EXPLORATION SESSIONS:

Each exploration will offer information on defining the core competency, creating coherent pathways for development, choosing assessment approaches, and providing necessary resources, all in an interactive format. Activities will be woven consistently into the session, so that participants have an opportunity to process, apply, and synthesize.

- 10:15 – 12:15 **Exploration #1: Oral Communication** (Susan Hatfield, Winona State University)
- 12:15 – 1:00 Lunch; networking with others or team discussion
- 1:00 – 3:00 **Exploration #2: Written Communication** (Kathleen Yancey, Florida State University)
- 3:00 – 3:15 Break

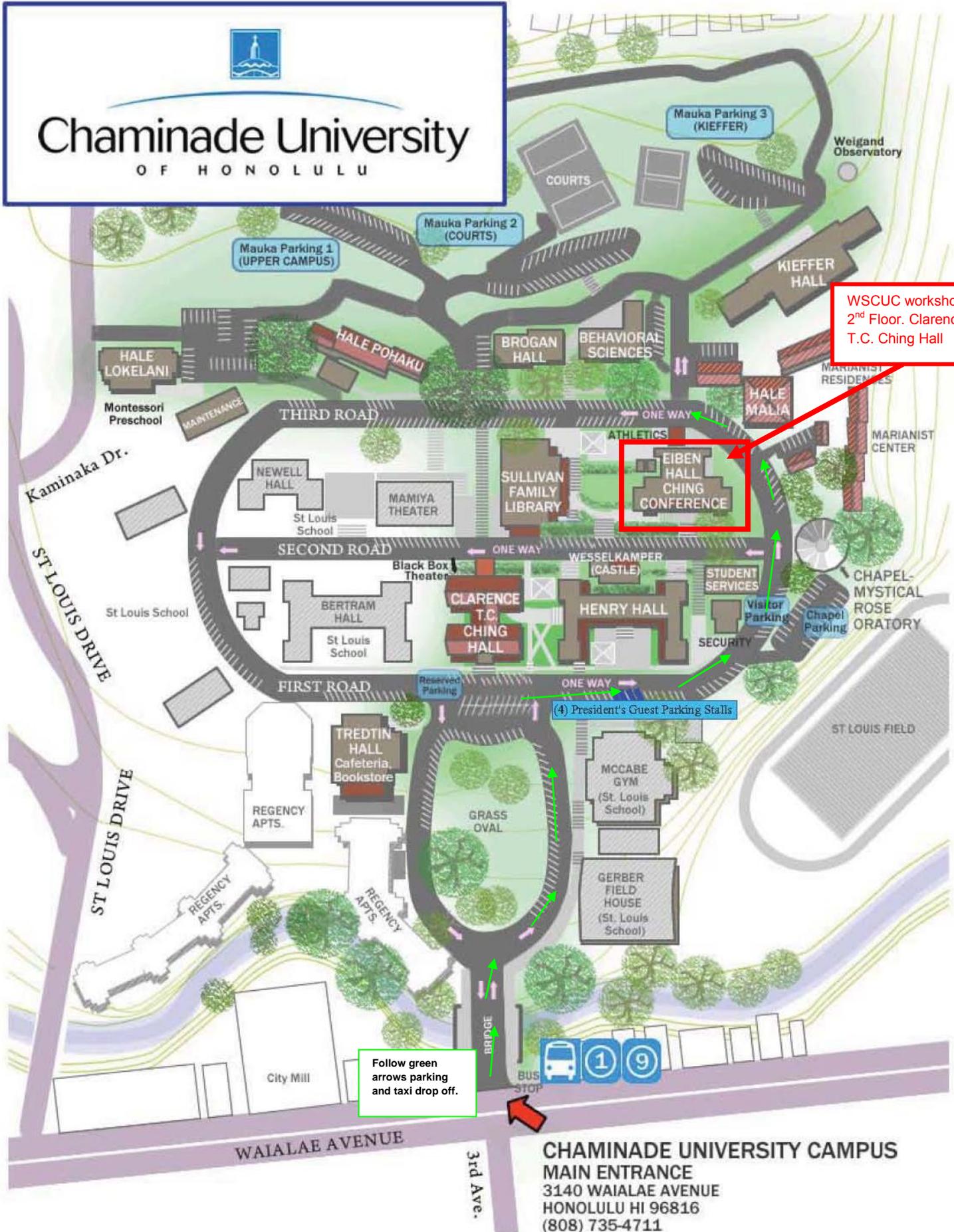
- 3:15 – 4:20 **Round Robin Conversations:** Oral Communication and Written Communication (Susan Hatfield, Kathleen Yancey)
- These two 30-minute meetings (with 5-minute break in between) are designed to accommodate participants' questions and spontaneous comments; there will be no formal presentations but plenty of opportunities for discussion, sharing, and networking.*
- 3:15 – 6:30 **Office hours** with CC facilitators and WSCUC representative (Jenifer Fabbi, Carol Gittens, Susan Elrod, Kathleen Yancey, Susan Hatfield, Melanie Booth)
- Office hours provide six 20-minute slots for private consultations. If you attend the round robin sessions first, you can still have office hour meetings with facilitators afterward. See sign-up sheets for exact times and availability.*

DAY 2

- 8:15 – 8:30 **Workshop Strategy Revisited:** Reconnection, reflection, adjustments (Melanie Booth, WSCUC)
- 8:30 – 10:30 **Exploration #3: Quantitative Reasoning** (Susan Elrod, CSU Chico)
- 10:30 Break
- 10:45 – 12:45 **Exploration #4: Information Literacy** (Jennifer Fabbi, CSU San Marcos)
- 12:45 – 1:30 Lunch; networking, team discussion, or informal consultation with facilitators
- 1:30 – 3:30 **Exploration #5: Critical thinking** (Carol Ann Gittens, Santa Clara University)
- 3:30 Break
- 3:45 – 4:15 **Reflection & Action Planning Part I** (Melanie Booth, WSCUC)
- 4:15 – 5:45 **Round Robin Conversations:** QR, CT, IL (Susan Elrod, Carol Gittens, Jennifer Fabbi)
- These three 25-minute meetings (with 5-minute break in between) follow the same format as round robins on Thursday: spontaneous Q&A, comments, discussion.*
- OR
- 4:15 – 5:45 **Office Hours:** Kathleen Yancey and Melanie Booth (WSCUC)
- If you wish to focus on QR, CT, or IL, you may attend the round robins; if you need one-on-one time on WC or WSCUC issues, you may sign up for an office hour appointment; or you may create a combination of activities.*
- 5:45 – 6:00 **Action Planning Part II & Workshop Wrap-up** (Melanie Booth, other facilitators)
- 6:00 – 7:00 **Office Hours** (if needed; see sign-up sheet for times and availability)



Chaminade University OF HONOLULU



WSCUC workshop.
2nd Floor. Clarence
T.C. Ching Hall

EIBEN HALL CHING CONFERENCE

Clarence T.C. Ching Hall

Follow green arrows parking and taxi drop off.

(4) President's Guest Parking Stalls



**CHAMINADE UNIVERSITY CAMPUS
MAIN ENTRANCE
3140 WAIALAE AVENUE
HONOLULU HI 96816
(808) 735-4711**

The Big Five: Addressing Core Competencies Mentor Biographies

Susan Elrod

Susan Elrod is currently serving as Interim Provost and VPAA at Chico State. She holds a Ph.D. in Genetics from the University of California-Davis and a B.S. in Biological Sciences from California State University-Chico. Prior to that, she was the Dean of the College of Science and Mathematics at Fresno State. Susan has worked as PI of an WM Keck Foundation funded project that has developed a model for systemic institutional change in STEM (science, technology, engineering and mathematics) education and Fresno State's NSF-funded FLOCK project that aims to enhance faculty development and introductory course outcomes in biology, calculus, chemistry, and physics. Prior to joining Fresno State, she was the Executive Director of Project Kaleidoscope (PKAL) at the Association of American Colleges & Universities in Washington, D.C. From 1997 – 2012, Elrod was a professor of Biological Sciences at Cal Poly, San Luis Obispo where she taught extensively and conducted both scientific and educational research. Among her administrative accomplishments, Elrod led development of their WASC institutional proposal self-study themes, served as assistant chair of the Biological Sciences Department, associate dean in the College of Science and Mathematics, and as the director of the Center for Excellence in Science and Mathematics Education (CESaME). In addition, she has more than 10 years of experience leading faculty development programs, consultations with campuses and organizations regarding undergraduate STEM education reform, and was an American Council on Education (ACE) Fellow. She is a California native and enjoys spending time in the great outdoors.

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Jen Fabbi

Jen Fabbi, is Professor and Dean of the Library at California State University, San Marcos. Prior to that, she was Associate Dean for Research and Education in the Libraries at the University of Nevada, Las Vegas, where she led the Libraries' efforts to partner in the university's research, education and community engagement mission. Jen served in several leadership capacities in the UNLV Libraries and on campus, including Head of the Curriculum Materials Library, Interim Director of Libraries Technical Services, Special Assistant to the Dean of Libraries, and two terms on the Executive Committee of the Faculty Senate. During the 2009-2010 academic year, she was on reassignment to the Office of the Associate Vice Provost for Academic Affairs, concentrating on an Undergraduate Education reform proposal that was subsequently approved by the Faculty Senate in fall 2011. Jen led campus faculty development efforts by partnering with others to implement new general education curriculum

The Big Five: Addressing Core Competencies Mentor Biographies

through “faculty institutes” on course design. Jen is the 2013-2014 co-chair of the American Association of School Librarians/Association of College and Research Libraries Interdivisional Committee on Information Literacy. She has published and presented more than 80 scholarly works, and her current research is on factors impacting the information literacy of first-year college students. Jen earned her Master’s in Library Science at the University of Arizona and her PhD in Higher Education Leadership at UNLV.

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Carol Ann Gittens

Carol Ann Gittens, is an Associate Dean in the College of Arts & Sciences at Santa Clara University and Associate Professor in the Education Department and Liberal Studies Program. As the Director of Santa Clara University’s Office of Assessment from 2007 to 2012, she performed key activities related to institutional re-accreditation; was a consultant to academic and co-curricular programs on the assessment of student learning; and designed and oversaw the campus’s innovative multi-year, rubric-based assessment plan for the core curriculum. She has served as a mentor at WSCUC assessment workshops and as an evaluator on WSCUC accreditation teams. Carol’s consulting activities include working with college administrators, faculty and staff and K-12 educators, as well as business executives, managers and employees. Her areas of expertise include integrating critical thinking across the curriculum and co-curriculum, critical thinking pedagogy and assessment, and designing sustainable assessment systems. The central focus of her research is the interface of critical thinking, motivation, mathematical reasoning, and academic achievement of adolescents and young adults from diverse cultural and ethnic backgrounds. Carol has authored or co-authored numerous articles, measurement instruments, and a college text book on critical thinking skills and dispositions. She earned her BA from the University of California at Davis and received her Ph.D. in Social and Personality Psychology from the University of California at Riverside.

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Susan Hatfield

Susan Hatfield joined the faculty of Winona State University in 1981. Since then, she has taught in the Communication Studies department, served for nine years as chairperson of that department, and served for 14 years as WSU’s Assessment

The Big Five: Addressing Core Competencies Mentor Biographies

Coordinator. As assessment coordinator, Susan has worked with numerous departments on developing and implementing plans to assess student learning at the program level. She has also worked with programs as they prepared their professional accreditation portfolios for organizations such as ABET, AACSB, and NCATE. Susan has served as an external grant evaluator for projects funded by the Fund for the Improvement of Postsecondary Education (FIPSE), the Bush Grant Foundation, and the US Department of Education Title III - Strengthening Institutions program. In 2001, she was appointed by the United States Secretary of the Navy to the Marine Corps University Board of Visitors. She also serves on the Board of Directors of the Joint Review Commission on Education in Radiologic Technology, and she is a Trustee of the Palmer College of Chiropractic. Dr. Hatfield is a peer evaluator for the Higher Learning Commission and is currently a Senior Scholar with the HLC's Academy projects.

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Kathleen Yancey

Kathleen Yancey is Kellogg W. Hunt Professor of English and Distinguished Research Professor at Florida State University. Her research focuses on composition studies; on writing assessment; and on the intersections of culture, literacy and technologies. In addition to co-founding the journal *Assessing Writing* and co-editing it for seven years, she has authored, edited, or co-edited twelve scholarly books and two textbooks as well as over 70 articles and book chapters. Her edited collection *Delivering College Composition: The Fifth Canon*, received the Best Book Award from the Council of Writing Program Administrators, and her ensemble article with Nancy Sommers and Doug Hesse won the Donald Murray Writing Prize. She is also the editor of *College Composition and Communication (CCC)*, the flagship journal in composition and rhetoric. Kathleen has served as president or chair of several scholarly organizations, including the National Council of Teachers of English (NCTE). She has served on the Steering Committee of the 2011 National Assessment of Educational Progress (NAEP) and the Steering Committee for the American Association of Colleges and Universities' (AAC&U) VALUE project. With Barbara Cambridge and Darren Cambridge, she leads the Inter/National Coalition on Electronic Portfolio Research (ncepr.org). Her co-edited volume *Electronic Portfolios 2.0* is based on the findings of the coalition. Now in its tenth year, the coalition includes over 60 institutional partners from around the world.

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The Big Five: Addressing Core Competencies Mentor Biographies

Melanie Booth (WSCUC representative)

Melanie Booth, Vice President, joined WSCUC in 2013. Melanie brings her experience serving as Assistant Chair on WSCUC visiting teams. She has also served on teams for the Northwest Commission of Colleges and Universities and as a reviewer for ACE's College Credit Recommendation Service. Prior to joining WSCUC, Melanie was the Dean of Learning and Assessment and Director of the Center for Experiential Learning and Assessment at Marylhurst University in Portland, OR. She has also held academic positions at Saint Mary's College of California, San Diego State University, and SCORE! Educational Centers. Melanie is a recognized expert on Prior Learning Assessment / Credit for Prior Learning and has consulted with institutions nationally and internationally about PLA, competency-based education, and the assessment of learning. Her other areas of interest include experiential learning, faculty development, heutagogy, and adult learning and development. Melanie's EdD is in Educational Leadership and Change – Higher Education from Fielding Graduate University; she earned her MA in Rhetoric and Writing from San Diego State University and her BA in English from Humboldt State University. She is a graduate of the second class of WSCUC's Assessment Leadership Academy.

The Big Five: Addressing Core Competencies

May 19-20, 2015 Chaminade University, Honolulu, HI

Attendee Directory

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The Big Five: Addressing Core Competencies

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Attendee Directory

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Attendee Directory

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WSCUC Expectations and a Framework for Approaching the Five Core Competencies

Melanie Booth


**The Big 5:
WSCUC's Core Competencies**

Melanie Booth
 Vice President, WSCUC
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1 The Big 5: Core Competency Workshop May 2015

Session Roadmap . . .

- What's the context for the 5 CCs?
- What are the 5 CCs?
 - And why the focus on standards of performance?
- What does WSCUC expect?
 - And how much autonomy do institutions have?
- What is a possible – *but not required!* - framework for good practice?
- THEN - How can we get the most from this workshop?

2



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"So we've got our core competencies, core products, core business, core customers, and no one is to use the word 'core' for at least a month."

What's the context for the 5 core competencies?

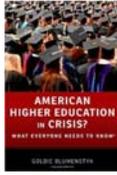
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HIGHER ED: Is There a Quality Problem???



College Grads Unprepared For Workplace, Study Says

NATIONAL CENTER FOR EDUCATION STATISTICS



The New York Times

4

Is There an Accreditation Problem?

Is the focus on ...

- Process?
- Inputs?
- Proxies for learning?
- Accountability?
- Rigorous review?
- Protect institutions?
- Stimulate innovation?

Or on ...

- Results?
- Outcomes?
- Actual learning?
- Improvement?
- Club of peers?
- Protect consumers?
- Stifle innovation?

5

Preparing Students for 21st Century

NUMEROUS VOICES:

- Employers
 - Higher Ed Media
 - Popular Books (e.g., *Academically Adrift*)
 - Graduate programs
 - Parents / The Public
- Other Resources:

- DQP
- AAC&U VALUE RUBRICS
- AAC&U LEAP
- Etc.

AND OUR OWN REGION!



6

We're Teaching – Are They Learning?



7

2013 Handbook of Accreditation



- 1. Adding UG 5 Core Competencies**
 - Written communication
 - Oral communication
 - Quantitative literacy
 - Information literacy
 - Critical thinking
- 2. Moving Toward Learning Results**

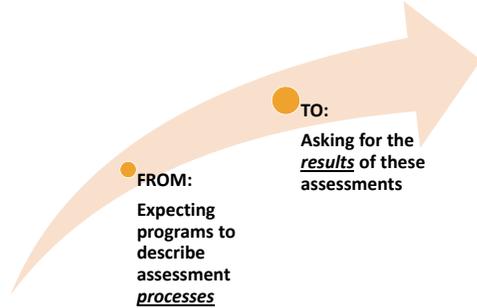
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WSCUC's Path Toward Learning Results



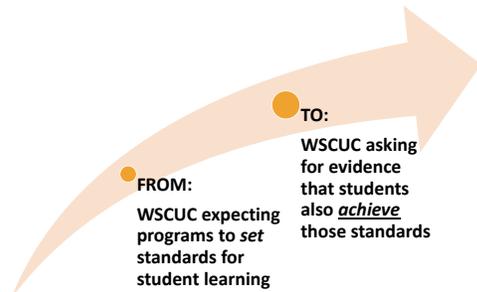
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A Learning Curve



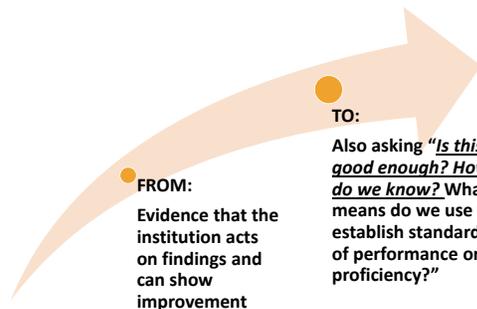
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Another Learning Curve



11

Yet Another Learning Curve



12



Many thanks to cogdogblog on Flickr for allowing this image to be used.

What are the 5 Core Competencies?

13

THE BIG 5!

In no particular order of importance:

- Critical Thinking**
- Information Literacy**
- Oral Communication**
- Quantitative Literacy**
- Written Communication**

14

What's the 2013 Handbook Say?

- 2.2 - All degrees—undergraduate and graduate—awarded by the institution are clearly defined in terms of entry-level requirements **and levels of student achievement necessary for graduation** that represent more than simply an accumulation of courses or credits.

15

What's the 2013 Handbook Say?

- 2.2a – Undergraduate programs ... ensure the development of core competencies including, but not limited to, **written and oral communication, quantitative reasoning, information literacy, and critical thinking.**

16

What's the 2013 Handbook Say?

- 2.6 - The institution demonstrates that its **graduates consistently achieve** its stated learning outcomes and established standards of performance.

17

What's the 2013 Handbook Say?

- 4.1 - The institution employs a deliberate set of quality-assurance processes ... including periodic program review, **assessment of student learning**, and other forms of ongoing evaluation. These processes include: collecting, analyzing, and interpreting data; tracking learning results over time; using comparative data from external sources; and improving structures, services, processes, curricula, pedagogy, and learning results.

18

Handbook – Component 4

- **Educational Quality: Student Learning, Core Competencies, and Standards of Performance at Graduation**

The institutional review process calls upon institutions to describe how the curriculum addresses each of the five core competencies, explain their learning outcomes in relation to those core competencies, and demonstrate, **through evidence of student performance, the extent to which those outcomes are achieved.** . . .

19



20

Standards Are About Outcomes

“Standards mean very little without knowing the **level of rigor** in the expectations that are expected. Rigor is established not by the teaching but the assessment: the rigor of the **task**, the rigor of the **models and rubric**, and the standard set by the model papers [or projects, or other student work products]. Faculties that spend all their time on thinking about instruction vis a vis the Standards will be missing the whole point of what a Standard is. **It specifies outcomes, not inputs.**”

- Grant Wiggins
- <http://grantwiggins.wordpress.com/2014/10/23/argument-the-core-of-the-common-core-and-a-clarifying-example/>

21

Standards Are About Expectations

Not only **WHAT** students should know or be able to do ...
(outcomes)

BUT ALSO

HOW WELL they should be able to do it!
(level of performance / rigor you expect)

22

Good! Good Enough?

- Standards of performance can be a powerful tool.
 - Reflect on what's important for students
 - Reflect on what's important for instructors and institutions
- They are a means, not an end.
- They are the logical next step for assessment – and accreditation.
- Used thoughtfully, they can move our institutions and higher education into the 21st century

23

Institution's Responsibility:

- Define each competency or outcome
- Establish an institutional standard of performance at or near graduation: "appropriately ambitious"
- Assess, (dis)aggregate findings
- Show extent to which students' performance meets the institution's standard of performance
- If improvement is needed, create a plan, with criteria, timeline, metrics, for judging progress
- Report to WSCUC

24

WSCUC's Responsibility:

- Provide support, be a partner in the process
- WSCUC will accept . . .
 - Variations within and across institutions
 - Multiple methods and approaches
 - Gradual implementation
 - Innovation, experimentation

25

WSCUC's Approach

- Standards of performance are defined by the institution, not WSCUC;
- Assessment methods are chosen by the institution, not WSCUC; and
- Institutions are urged to contextualize results, data/evidence, relative to similar types of institutions and a larger universe.
- Benchmarking is encouraged, but not required.

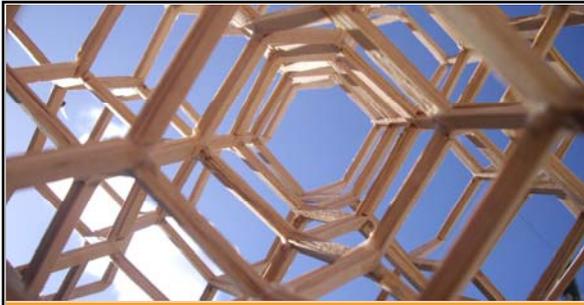
26

WSCUC's Role: Trust and Verify

The WSCUC accreditation process verifies that the institution has:

- set its own standards of performance;
- calibrated its level of performance/proficiency in some way, e.g., internally, against peers, employer expectations
- generated data/evidence of learning results; and
- developed plans for improvement where needed

27



One Possible Framework:
(Note: Not WSCUC's Required Framework; Just
One Idea)

28

We Have The 5 CCs . . .

So why not use the
3 I's?

1. INTEGRATIVE
2. ITERATIVE
3. INTERDISCIPLINARY



29

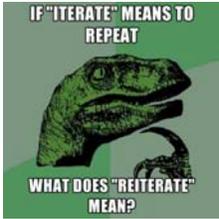
INTEGRATIVE

- Unifying separate things
- To bring together parts into a whole



30

ITERATIVE



- The act of repeating a process with the aim of approaching a desired goal, target, or result.
- And if it's not moving toward the goal, modify the process!

31

INTERDISCIPLINARY

- Crossing academic boundaries
- Thinking across academic disciplines
- Combining of two or more disciplines

connecting and integrating several academic schools of thought, professions, or technologies—along with their specific perspectives—in the pursuit of a common task



Image from Aquent's E-Fall Service

32

CONSIDERATIONS

- How might the 5 CCs be **integrative** at your institution?
 - For students – their “lived curriculum”
 - For faculty
 - For departments / disciplines / programs
- How might you address the 5 CCs in an **iterative** way?
- How might you address the 5 CCs with an **interdisciplinary** approach?

33

Mix in Some Good Assessment Practice

- Focus on student learning
- Faculty-led – What do faculty care about? How do their disciplines / departments engage with or support the 5 CCs? Where are areas of collaboration?
- Don't re-create the wheel: What is already occurring? Where? How?
- Catch multiple butterflies with one assessment net
- Accept current realities and plan, identify, and advocate for needed resources
- Collect, reflect, adapt, improve!

34

SUCCESS



**WHAT PEOPLE THINK
IT LOOKS LIKE**

SUCCESS



**WHAT IT REALLY
LOOKS LIKE**

35

GRADE A EGG

QUALITY GUARANTEED

Thank You!

36

The Big 5: Addressing WSCUC's Core Competencies Self-Assessment & Planning Worksheets

Over the course of the Big 5 workshop, use these worksheets to help identify institutional strengths, needs, and plans related to the 5 core competencies.

DAY 1: DEVELOPING A WORKSHOP STRATEGY (9:30 – 10:00 a.m.)

Based on the agenda for the workshop and your institution’s needs, take this time to engage in an institutional self-assessment and to create a strategy for making the most of your time here.

PART 1 – INSTITUTIONAL SELF-ASSESSMENT

The 5 Core Competencies

On a scale of 1-10, with 10 being highest, how well-developed is your institution’s approach toward each core competency?

Consider these questions:

- To what extent are faculty engaged with the core competency?
- To what extent are students aware of the competency and why it matters?
- Have learning outcomes been developed and articulated? Are they institution-wide or area-specific?
- Have standards of performance been defined?
- Are the learning outcomes and standards appropriately ambitious for your institution and its students?
- Where is the learning taking place in / across the curriculum?
- Where and when are the assessments occurring?
- Are there sufficient assessment systems in place to manage the assessment and improvement processes?
- Overall, in regard to each core competency, what is your institution doing well? What are your institution’s areas for improvement?

<p>Written Communication</p> <p>No Clue 1 2 3 4 5 6 7 8 9 10 We ROCK!</p>	<p>Comments / notes about Written Communication:</p>
<p>Information Literacy</p> <p>No Clue 1 2 3 4 5 6 7 8 9 10 We ROCK!</p>	<p>Comments / notes about Information Literacy:</p>

<p>Oral Communication</p> <p>No Clue 1 2 3 4 5 6 7 8 9 10 We ROCK!</p>	<p>Comments / notes about Oral Communication:</p>
<p>Critical Thinking</p> <p>No Clue 1 2 3 4 5 6 7 8 9 10 We ROCK!</p>	<p>Comments / notes about Critical Thinking:</p>
<p>Quantitative Reasoning</p> <p>No Clue 1 2 3 4 5 6 7 8 9 10 We ROCK!</p>	<p>Comments / notes about Quantitative Reasoning:</p>

PART 2 – WORKSHOP STRATEGY

What are my/our learning goals and needs for this workshop? (If you are here with others from your institution, what are your collective learning goals?)

Given the workshop agenda, how can I/we make the best use of the time? (If you are here with others from your institution, how might you allocate each person's time to make the most of the sessions?)

With whom do I/we want to meet for office hours? What specifically would we like advice about?

DAY 2 - MORNING: RECONNECTION, REFLECTION, AND WORKSHOP STRATEGY ADJUSTMENTS (8:15 – 8:30 a.m.)

Given what you learned or experienced on Day 1, revisit your self-assessment from Day 1 and make any modifications.

Do you want to adjust your plan for Day 2? If so, how:

DAY 2 - AFTERNOON: REFLECTIONS & ACTION PLANNING PART I (3:45 – 4:15 p.m.)

Reflections

Lessons Learned

What are some of the main take-aways from this workshop that we need to integrate into a plan and take back to the institution?

Network Support

What contacts have we made with people at institutions with similar situations or contexts? With whom should we talk to further?

Developing a Big 5 Plan

<p>Big 5 Plan: Goals & Evidence</p> <p><i>What should my/our institution's goals be around the Big 5? What are the priority areas or competencies for development or improvement? What will success look like when we've fully met these goals? What evidence will we need to know that we've met the goals?</i></p>	<p>Big 5 Plan: Resources</p> <p><i>What resources might we need to ensure our Big 5 plan can be achieved? Who else at the institution do we need to engage in this work? What are their roles?</i></p>
<p>Big 5 Plan: Leadership & Advocacy</p> <p><i>How can I/we take a leadership role in this work? Who do we need to advocate for this plan? How do we communicate the plan to leadership? Across the institution?</i></p>	<p>Big 5 Plan: Processes</p> <p><i>What processes might I/we need to develop or change to support the plan? How can we go about doing so?</i></p>

DAY 2 - END OF WORKSHOP – REFLECTIONS & ACTION PLANNING PART II (5:45 – 6 p.m.)

Big 5 Plan - Next Steps: 30 Days

What are the first steps we need to take to continue this work in the next 30 days?

Big 5 Plan - Longer Range

What do we want to accomplish in the next 6 months? In the next 12 months?

Exploration #1: Oral Communication

Susan Hatfield

Assessing Oral
Communication: Choices and
Challenges

Susan Hatfield
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The Challenge:
Balancing good practice in
oral communication
assessment
.....with reality



Another Challenge:
Assessing oral communication
with integrity
without driving faculty crazy



The Irony:
The easiest way
to do assessment
...is the way to which faculty
may most strenuously object



WASC's definition of Oral Communication



...communication by means of spoken language for informational, persuasive, and expressive purposes. In addition to speech, oral communication may employ visual aids, body language, intonation, and other non-verbal elements to support the conveyance of meaning and connection with the audience. Oral communication may include speeches, presentations, discussions, dialogue, and other forms of interpersonal communication, either delivered face to face or mediated technologically.

WASC's definition of Oral Communication



- Allows for
- √ Multiple definitions
 - √ Multiple approaches
 - √ Different types of communication
 - Public Speaking
 - Group Communication
 - Interpersonal Communication

WASC's definition of Oral Communication



Allows for

- √ Multiple definitions
- √ Multiple approaches

Expects

- √ Assessment "at or near graduation"
- √ Higher level aggregation
 - institution or college level –
 - (choice left to the institution)

WASC's definition of Oral Communication



- √ Necessitates **Compromise- iterative**
- √ Facilitates **Cooperation -integrative**
- √ Requires **Communication - interdisciplinary**

Effective ~~Best~~ Practices in Assessing Oral Communication





Best Practice	Great - if you can make it happen
Good Practice	This can work!
Problematic Practice	Try to avoid doing this...

1. Assessing Oral Competency as a core competency

Best Practice	Oral communication is assessed as a part of a coordinated institution wide effort to assess the Core Competencies
---------------	---

	2015 2016	2016 2017	2017 2018
Oral Communication	X X		
Written Communication		X X	
Information Literacy	X X		X X
Quant Literacy		X X	
Critical Thinking			X X

1. Assessing Oral Competency as a core competency

Best Practice

Oral communication is assessed as a part of a coordinated effort to assess the Core Competencies

Good Practice

Programs select their own timeframes for assessing the competencies

	2015 2016	2016 2017	2017 2018
Biology	QL QL	IL IL	CT CT
MIS	CT CT	QL QL	IL IL
Engineering	IL IL	CT CT	IL IL
English	W W	IL IL	OC OC
Comm Studies	OC OC	IL IL	CT CT

1. Assessing Oral Competency as a core competency



Best Practice

Oral communication is assessed as a part of a coordinated effort to assess the Core Competencies

Good Practice

Programs select their own timeframes for assessing the competencies

Problematic Practice

Competencies are assessed serially

	2015-2018		2019-2022		2023-2027	
Oral Communication	X	X				
Written Communication			X	X		
Information Literacy					X	X
Quant Literacy						
Critical Thinking						

2. Identifying Oral Communication Outcomes

Best Practice Oral communication is an institution-wide outcome

Obtain information essential to the accomplishment of a task

2. Identifying Oral Communication Outcomes



Best Practice

Oral communication is an institution-wide outcome

Good Practice

The oral communication outcome is contextualized by programs

Educate patients and/or caregivers regarding the treatment plan.



2. Identifying Oral Communication Outcomes



Best Practice

Oral communication is an institution-wide outcome

Good Practice

The oral communication outcome is contextualized by programs

Problematic

Outcomes are idiosyncratic to individual faculty



100 faculty = 100 different oral communication outcomes

100 faculty x 3 courses each = 300 outcomes

3. Defining Oral Communication Competency



- What are we looking for in our students' performance?
- How will we know it when we see it?

3. Defining Oral Communication Competency



Best Practice

A campus-wide definition of competency in oral communication

Competency in Oral Communication



.....requires a demonstrated grasp of general purpose and specific occasion; the effective organization of material with emphasis on key ideas; the stylistic use of vivid and clear language as well as vocal and bodily expressiveness; and meaningful, appropriate and sustained engagement with the audience.

3. Defining Oral Communication Competency



Best Practice

A campus-wide definition of competency in oral communication

Good Practice

Each program defines oral communication competency

Competency in Oral Communication



....speak enthusiastically and use vivid language, examples, or anecdotes to communicate a message; make use of unambiguous language, gestures, and nonverbal communication.

Competency in Oral Communication



.....requires the basic skills of considering the needs of an audience and how it is likely to react, talking to people in a way they can understand, listening attentively to others, and using appropriate grammar and vocabulary.

Public Speaking

organization
content
delivery
eye contact
rate
evidence
claims
poise
conclusion
sources
examples
powerpoint
transitions
verbal variety
attention getter

Share Information

purpose
content
language
eye contact
connection
rapport
word choice
focus
closing
poise
demeanor
explanation
attentiveness
engagement
responsive

3. Defining Oral Communication Competency



Best Practice

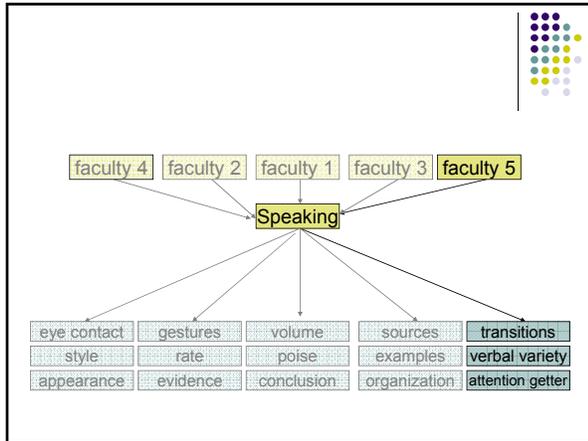
A campus-wide definition of competency in oral communication

Good Practice

Program define oral communication competency

Problematic Practice

Each faculty member defines oral communication competency differently



Can our students deliver an effective Public Speech?

eye contact gestures volume sources transitions
 style rate poise examples verbal variety
 appearance evidence conclusion organization attention getter

4. Supporting the achievement of Oral Communication Competency

Best Practice

Structured oral communication experiences are intentionally embedded in the curriculum

Student Learning Outcomes

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓

Oral Comm	K		A		A			A	A	S
2		K	A	S						
3	K					K		K	K	
4										
5	K									S
6		K			K	A		A	S	
7		S			A	A			S	

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

Student Learning Outcomes

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓

Oral Comm	K		A		A			A	A	S
------------------	---	--	---	--	---	--	--	---	---	---

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

4. Supporting the achievement of Oral Communication Competency



Best Practice	Structured oral communication experiences are intentionally embedded in the curriculum
Good Practice	There are oral communication activities in the curriculum, though the context may vary

Student Learning Outcome

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓

Oral Comm ✓ ✓ ✓ ✓

Individual Presentation
Group Presentation
Interview
Poster Session
Debate
Question / Answer

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

4. Supporting the achievement of Oral Communication Competency



Best Practice	Structured oral communication experiences are intentionally embedded in the curriculum
Good Practice	There are oral communication activities in the curriculum, though the context may not match the outcome
Problematic Practice	Oral Communication is idiosyncratically or informally supported by the curriculum

Student Learning Outcome

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓

Oral Comm

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

Student Learning Outcome

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓

Oral Comm K K K K

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

Student Learning Outcome

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓

Oral Comm K S

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

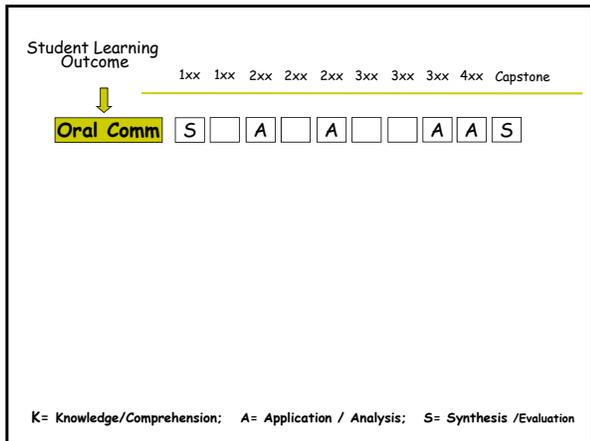
Student Learning Outcome

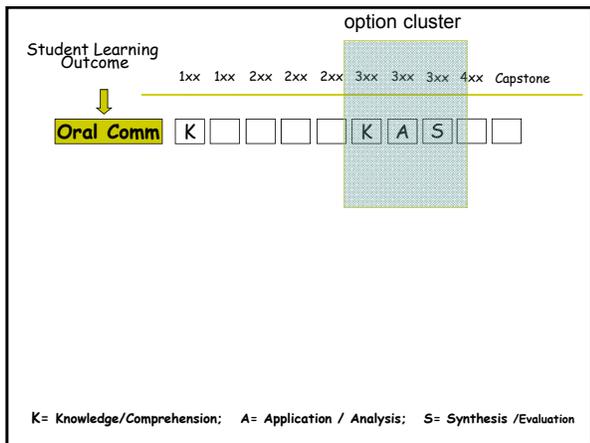
1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

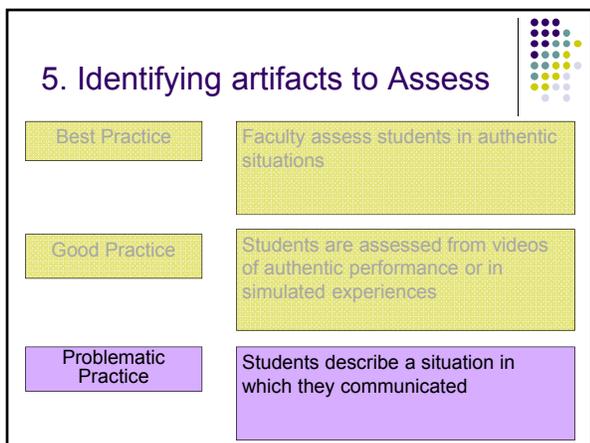
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Oral Comm K A S

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation









“In my internship I had the opportunity to present to many groups, clubs and organizations. The presentations were generally between 10 and 15 minutes. I felt confident and well prepared. The audience seemed interested in what I was saying and applauded at the end.”

6. When to assess oral communication competency



Best Practice

Oral Communication is assessed both formatively and summatively

Student Learning Outcomes

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

Oral Comm K A A A A S

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

6. When to assess oral communication competency



Best Practice

Oral Communication is assessed both formatively and summatively

Good Practice

Oral communication is assessed toward the end of the program

Student Learning Outcomes

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓
Oral Comm K A A A S

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

6. When to assess oral communication competency



Best Practice

Oral Communication is assessed both formatively and summatively

Good Practice

Oral communication is assessed toward the end of the program

Problematic Practice

Random Acts of Oral Communication Assessment

Student Learning Outcomes

1xx 1xx 2xx 2xx 2xx 3xx 3xx 3xx 4xx Capstone

↓

Oral Comm K A A A A S

K= Knowledge/Comprehension; A= Application / Analysis; S= Synthesis /Evaluation

Measuring Oral Communication Competency

Best Practice

Combining assessment and evaluation by developing a tool that provides feedback to both the student and college

	Evaluation	Assessment
Quizzes	Count toward final grade	Used to check if Students are on track
Tests	Scored and returned	Scored, tabulated. returned & discussed; adjustments to syllabus
Rubrics	Returned to students with grade	Returned after being aggregated & analyzed; adjustments to syllabus

7. Connecting Evaluation and Assessment of Oral Communication



Best Practice

Combining assessment and evaluation by developing a tool that provides feedback to both the student and college

Good Practice

Uses an instrument designed to provide an assessment of student work

	No	Yes	Comments
Content and Organization			
Was the purpose for the session clearly stated?			
Was the speaker prepared?			
Did the speaker develop rapport with the audience?			
Did the speaker provide an overview of the purpose and direction of the message?			
Were the main points clearly stated?			
Were changes in topics handled smoothly?			
Did the speaker pick up on/ respond to audience cues?			
Did the speaker support claims with evidence and use sound reasoning?			



7. Connecting Evaluation and Assessment of Oral Communication



Best Practice

Combining assessment and evaluation by developing a tool that both provides feedback to the student and college

Good Practice

Uses an instrument designed to provide an assessment of student work

Problematic Practice

Oral communication is assessed globally

8. Using Rubrics to Assess Oral Communication Competency



Best Practice

A rubric that allows flexibility for different definitions of oral communication

Good Practice

An institution-wide rubric for assessing oral communication competency

Problematic Practice

Students self report their oral communication competency on a rubric or survey.

Using Rubrics to Assess Oral Communication



I would assess my ability to communicate as

- a. Excellent
- b. Very Good
- c. Average
- d. Below Average

9. Using Assessment Data



Best Practice

Oral Competency data prompts institution wide discussions with the goal of impacting teaching and learning

9. Using Assessment Data



SoTL conversations
Conferences
Faculty Development
Center for Teaching and Learning events

9. Using Assessment Data



Best Practice

Oral Competency data prompts institution wide discussions with the goal of impacting teaching and learning

Good Practice

Data is reviewed by a core group of individuals and reported out to the campus

Assessment Committee
Core Competency Committee

Web pages
Newsletters
Faculty Development presentations



9. Using Assessment Data



Best Practice

Oral Competency data prompts institution wide discussions with the goal of impacting teaching and learning

Good Practice

Data is reviewed by a core group of individuals and reported out to the campus

Problematic Practice

It is not clear what happens to the data after it is collected

10. Participation in Oral Communication Assessment



Best Practice

Widespread, enthusiastic engagement among faculty, staff and students

10. Participation in Oral Communication Assessment

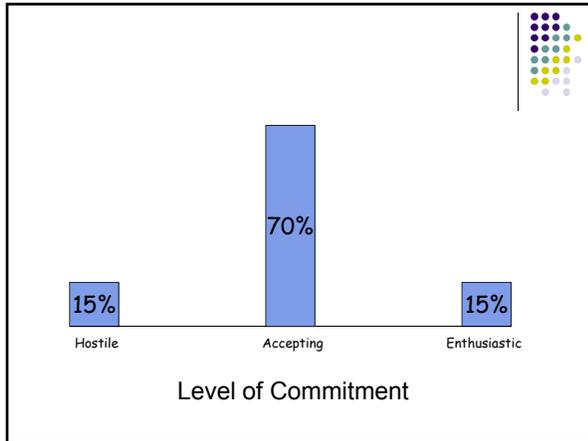


Best Practice

Widespread, enthusiastic engagement among faculty, staff and students

Good Practice

Key faculty engaged



10. Participation in Oral Communication Assessment

Best Practice	Widespread, enthusiastic engagement among faculty, staff and students
Good Practice	Key faculty engaged
Problematic Practice	One person trying to make it work

11. Reporting Oral Communication Assessment

Best Practice	Programs summarize their students' oral communication competency in a structured, systematic format.
---------------	--

	Does not meet	Meets	Exceeds
Verbal Delivery	14%	81%	5%
Nonverbal Delivery	22%	74%	4%
Organization	14%	79%	7%
Evidence	9%	72%	19%
Transitions	7%	85%	8%

Program Summary

11. Reporting Oral Communication Assessment



Best Practice Programs summarize their students' oral communication competency in a structured, systematic format.

Good Practice Reporting is separate but structured and overlapping

12. Implementing Oral Communication Assessment



Best Practice Pilot tests for all steps in the process across multiple disciplines. Time set aside for process analysis.

Good Practice Focused implementation in single program prior.

Problematic Practice Widespread implementation without clear plan for data aggregation or analysis. Commitment to specific tools.

13. Leading Oral Communication Assessment Initiatives



Best Practice	Ongoing discussion and support for assessment at all levels of the organization
Good Practice	Working committee with clear mission and purpose
Problematic Practice	Personality driven assessment rather than structurally driven assessment

13. Leading Oral Communication Assessment Initiatives



Best Practice	Ongoing discussion and support for assessment at all levels of the organization
Good Practice	Working committee with clear mission and purpose
Problematic Practice	Mention of assessment happens only in the 6 months before a site visit

Assessing Oral Communication: Choices and Challenges



Susan Hatfield
 Winona State University
 HLC Senior Scholar
 SHatfield@winona.edu

Identifying Components

A Convey information and ideas through a variety of media.

a _____

B Use appropriate interpersonal styles and techniques to achieve the purpose of the encounter.

b. _____

C Deliver presentations suited to the characteristics and needs of the audience.

c _____

D Explore alternatives and positions to reach outcomes that gain the support and acceptance of all parties.

d _____

E Establish collaborative relationships to facilitate the accomplishment of goals.

e _____

F Facilitate the movement of a team toward the completion of a goal

f _____

G Obtain information essential to the accomplishment of a task.

g _____

1. Adheres to accepted conventions
2. Adjusts to the receiver /audience
3. Builds collaborative relationship/s
4. Builds rapport
5. Builds support for preferred alternatives
6. Clarifies the current situation
7. Closes with clear summary/ies
8. Understands what is being said
9. Defines clear goals
10. Establishes credibility
11. Develops others' and own ideas
12. Encourages boundary breaking
13. Strives to create understanding
14. Establishes strategy
15. Explains and demonstrates
16. Facilitates agreement
17. Facilitates goal accomplishment
18. Follows a logical sequence
19. Gains commitment
20. Identifies areas of agreement/disagreement
21. Informs others on team

22. Involves others
23. Keeps communication focused
24. Listens
25. Maintains audience attention
26. Manages complexity and contradictions
27. Models commitment
28. Opens discussions effectively
29. Organizes the message
30. Provides feedback and reinforcement
31. Questions and probes
32. Responds to questions and objections
33. Rewards change
34. Seeks opportunities
35. Seeks to understand
36. Identifies future steps / agenda
37. Subordinates personal goals
38. Summarizes the session
39. Uses effective interpersonal skills
40. Uses effective interpersonal skills
41. Uses learning aids to support ideas
42. Manages nonverbal messages
43. Values sound approaches

Exploration #2: Written Communication

Kathleen Yancey

WASC Hawaii Five-O



WRITTEN COMMUNICATION: OUTCOMES, ASSESSMENT, CURRICULAR REVISION

(ITERATIVE, INTEGRATIVE, INTERDISCIPLINARY)

Goals and Outcomes



- **Consider possible models for writing assessment**
- **Engage with a heuristic for designing writing assessments**
- **Use a set of scenarios to explore how a full and *usable* assessment cycle works**
- **Identify ways of setting standards**
- **Begin planning a usable assessment**
- **Receive feedback on the assessment**
- **Articulate next steps**

WASC Definition of Written Communication



Communication by means of written language for informational, persuasive, and expressive purposes.

Written communication may appear in many forms, or genres.

Successful written communication depends on mastery of the conventions of the written language, facility with culturally accepted structures for presentation and argument, awareness of audience, and other situation-specific factors.

Capacious and Flexible



Allows for multiple definitions and diverse approaches

Expects assessment “at or near graduation”

Expects a higher-level of aggregation

Requires institution to determine definitions, outcomes, standards, and a plan keyed to *use*

RESOURCES FOR AND PERSPECTIVES ON OUTCOMES

**The WPA Outcomes Statement (for Writing)
The CCCC Position Statement on Writing Assessment
The AAC&U VALUE Scoring Guide for Assessing Writing**



**Local Campus Mission and Values
Student-identified Outcomes**

WPA Outcomes Statement for First-Year Composition (v3.0) (adopted 17 July 2014)

Introduction

This Statement identifies outcomes for first-year composition programs in U.S. postsecondary education. It describes the writing knowledge, practices, and attitudes that undergraduate students develop in first-year composition, which at most schools is a required general education course or sequence of courses. This Statement therefore attempts to both represent and regularize writing programs' priorities for first-year composition, which often takes the form of one or more required general education courses. To this end it is not merely a compilation or summary of what currently takes place. Rather, this Statement articulates what composition teachers nationwide have learned from practice, research, and theory.¹ It intentionally defines only "outcomes," or types of results, and not "standards," or precise levels of achievement. The setting of standards to measure students' achievement of these Outcomes has deliberately been left to local writing programs and their institutions.

In this Statement "composing" refers broadly to complex writing processes that are increasingly reliant on the use of digital technologies. Writers also attend to elements of design, incorporating images and graphical elements into texts intended for screens as well as printed pages. Writers' composing activities have always been shaped by the technologies available to them, and digital technologies are changing writers' relationships to their texts and audiences in evolving ways.

These outcomes are supported by a large body of research demonstrating that the process of learning to write in any medium is complex: it is both individual and social and demands continued practice and informed guidance. Programmatic decisions about helping students demonstrate these outcomes should be informed by an understanding of this research.

As students move beyond first-year composition, their writing abilities do not merely improve. Rather, their abilities will diversify along disciplinary, professional, and civic lines as these writers move into new settings where expected outcomes expand, multiply, and diverge. Therefore, this document advises faculty in all disciplines about how to help students build on what they learn in introductory writing courses.

What Do Students Know? What Can They Do?

- 1. Rhetorical knowledge**
- 2. Critical thinking, reading, and composing**
- 3. Processes**
- 4. Conventions**



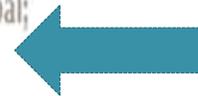
Council of Writing Program Administrators

Rhetorical Knowledge

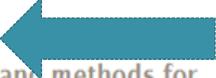
- reading, analyzing, and composing a **variety of texts--and genres**;
- **responding to different situations and contexts** (in terms of voice, tone, formality, design, medium);
- understanding a **variety of technologies** and their **impact on audiences**; using different technologies and media depending on situation;
- and, re: specific field/ discipline, understanding the purposes, audiences, and genres specific to that field/discipline.

Critical Thinking, Reading, Composing

- reading & composing in **various contexts**;
- reading a **range of texts** (for various audiences and situations; differentiating between assertions and evidence and understanding organization and the relationship between verbal/nonverbal);
- evaluating sources (primary and secondary) that are **scholarly/professional**;
- **integrating ideas of other writers/** appropriate sources through **various strategies** (interpretation, synthesis, response, critique, etc.);



Composing Processes

- all aspects of **composing; now more detailed** to include “reading, drafting, reviewing, collaborating, revising, rewriting, rereading, and editing”;
- understanding that the composing process is a **tool for discovery** and reconsidering ideas;
- **“acting” on feedback** from others; giving good feedback;
- **adapting** processes according to different technologies and modalities;
- **reflecting** on their processes and practices; 
- re: specific field/discipline: using technologies and methods for research and communicating in specific discipline; characterizing processes; reviewing works in progress on a deep level; collaborating in their specific field/discipline.

Conventions Keyed to Logic

- understanding that conventions come out of a “history of use” and present “common expectations” among readers and writers;
- as a reader and composer, understanding **conventions in terms of purpose, audience, and genres**; also being aware that **genres—and their conventions—evolve** in relation to context and technology;
- gaining knowledge of language, structure (grammar, etc.), and organization through composing and revising;
- practicing using **various genres with various conventions**—and learning **the formats/design** of different texts
- understanding **intellectual property (IP)**; practicing citation conventions;
- re: specific field/discipline: understanding conventions of language, citation, etc., how to control conventions, what influences conventions; how to make decisions around IP related to the genres and modes of that specific field/discipline.

CCCC Position Statement
 A statement on an education issue approved by the CCCC Executive Committee
Writing Assessment: A Position Statement

- 1. Writing assessment is useful primarily as a means of improving teaching and learning. The primary purpose of any assessment should govern its design, its implementation, and the generation and dissemination of its results.**
- 2. Writing is by definition social. Learning to write entails learning to accomplish a range of purposes for a range of audiences in a range of settings.**
- 3. Any individual's writing ability is a sum of a variety of skills employed in a diversity of contexts, and individual ability fluctuates unevenly among these varieties.**
- 4. Perceptions of writing are shaped by the methods and criteria used to assess writing.**
- 5. Assessment programs should be solidly grounded in the latest research on learning, writing, and assessment.**

WRITTEN COMMUNICATION VALUE RUBRIC

for more information, please contact valrub@aacu.org



Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing text, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

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

	Capstone 4	Milestones 3	Milestones 2	Benchmark 1
Context of and purpose for writing <i>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</i>	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned task(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned task(s) (e.g., expectation of instructor or self as audience).
Content Development	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.	Uses appropriate and relevant content to develop and explore ideas through most of the work.	Uses appropriate and relevant content to develop simple ideas in some parts of the work.
Genre and disciplinary conventions <i>Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</i>	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices.	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices.	Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation.	Attempts to use a consistent system for basic organization and presentation.
Sources and evidence	Demonstrates skillful use of high quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing.	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.	Demonstrates an attempt to use sources to support ideas in the writing.
Control of syntax and mechanics	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.

	Capstone 4	Milestones 3 2		Benchmark 1
Context of and purpose for writing <i>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</i>	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned task(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned task(s) (e.g., expectation of instructor or self as audience).
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Local Institutional Mission/Initiative

(What's the local culture?)

Student Outcomes

(What outcomes would students identify?)

A HEURISTIC FOR DESIGNING *USEFUL* WRITING ASSESSMENTS

∞ What are the **outcomes**? What do students know, and what can they do?

WPA Outcomes Statement 3.0 (Council of Writing Program Administrators)

CCCC Position Statement on Writing Assessment (Conference on College Composition and Communication)

AAC&U VALUE Rubric for Written Communication (Association of American Colleges and Universities)

Local/Mission-driven (Campus Mission and Values)

Student-identified Outcomes

∞ What is the **unit of assessment**?

Individual student

What did we learn?

RESOURCES FOR AND PERSPECTIVES ON OUTCOMES

The WPA Outcomes Statement (for Writing)
The CCCC Position Statement on Writing Assessment
The AAC&U VALUE Scoring Guide for Assessing Writing



Local Campus Mission and Values
Student-identified Outcomes

Multiple Genres for WAC: Portfolio

1. Papers from at least three different departments or programs. Please do not submit more than one paper from a single course - variety shows your breadth as a writer;
2. At least one paper that reports on something you have observed (for example, field notes for science or social science courses, a laboratory report, a description of art, a play, or music, etc.);
3. At least one paper that demonstrates your ability to analyze complex information (for example, numeric data, multiple texts, multiple observations, etc.);
4. At least one paper that provides interpretation (of data, a text, a performance, etc.);
5. At least one paper that demonstrates your ability to identify and effectively use appropriate sources (other than the primary text for the assignment), properly documented;
6. At least one paper that shows your ability to articulate and support a thesis-driven argument;
7. Evidence that you can effectively control Standard American English in multiple curricular settings.

integrative

iterative

interdisciplinary



assessment enhancing learning

First, be aware that you must write a paper specifically for the portfolio that will introduce the portfolio to your readers and demonstrate that you are able to write in a range of disciplinary contexts.

Write a reflective essay in which you argue for your accomplishments on the writing tasks listed below, using your papers as evidence. This essay is typically read first, giving the readers of your portfolio insight into your thinking about your writing. You will have chosen the work and provided some information about the assignments, but only you can explain how your portfolio demonstrates your accomplishments as a writer.

Iterative

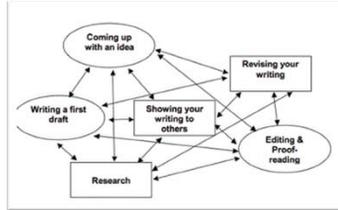
For example, the **history department**, unhappy with senior papers that were often narratives without theoretical sophistication, **changed its sophomore-level gateway course** to introduce historical theory and to develop **new kinds of assignments** so that students would begin learning how to apply different theoretical perspectives to historical problems and to create thesis-governed historical arguments using primary sources and archival data.

The **finance department** has defined its capstone projects as short persuasive memos, addressed to specified audiences, arguing for a “best solution” to an **ill-structured (open-ended) finance problem**. Because finance professionals must frequently address lay audiences as well as finance experts, the department is **especially interested in students’ ability to shift audiences**, constructing some arguments in an **expert-to-lay context** (with appropriate use of language and graphics) and some in **expert-to-expert** context.

The screenshot shows the website for the University of Minnesota's Writing-Enriched Curriculum (WEC). The browser address bar displays //wec.umn.edu/. The page features a navigation bar with links for myU, One Stop, Directories, and Search U of M. The main header includes the University of Minnesota logo and the slogan "Driven to Discover". Below this, the WEC logo is prominently displayed, followed by the text "WRITING-ENRICHED CURRICULUM". A collage of images illustrates various academic and creative activities, including a person writing, a person speaking, and musical notation. The page is organized into several sections: "Process" (Writing Plans, Research & Assessment, People, Contact Us, FAQ, Faculty Liaisons >), "WEC Home Page" (featuring a video of Ben Adams, a Mechanical Engineering student, in a library setting), and "Academic Units" (listing various departments such as African American and African Studies, Agronomy and Plant Genetics, Architecture, Art History, Carlson School of Management, Clinical Laboratory Science, College of Biological Sciences, Computer Science, and Construction).

standards and felt sense

We are in the process of revising our course outlines for both of the courses in our FYC sequence. The real issue that the assessment confirmed for us (since I think many had a sense of it already) is that our students struggle when it comes to doing quality revision and many of our faculty struggle to teach it. The revised course outlines highlight and emphasize revision.



Beginning to plan . . .

Critical Friends

1. You are a faculty member at this institution. What's the most helpful part of this plan?
2. If this were your plan, how might you consider improving it?

Index Card Notes to Self

- Short term
- Long term

WASC Hawaii Five-O



**WRITTEN COMMUNICATION:
OUTCOMES, ASSESSMENT, CURRICULAR REVISION**
(ITERATIVE, INTEGRATIVE, INTERDISCIPLINARY)

*KATHLEEN BLAKE YANCEY/FLORIDA STATE UNIVERSITY
KYANCEY@FSU.EDU*

A HEURISTIC FOR DESIGNING *USEFUL* WRITING ASSESSMENTS

∞ What are the **outcomes**? What do students know, and what can they do?

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AAC&U VALUE Rubric for Written Communication (Association of American Colleges and Universities)

Local/Mission-driven (Campus Mission and Values)

Student-identified Outcomes

∞ What is the **unit of assessment**?

Individual student

Unit (e.g., course, program, department, college, institution)

Both individual and unit

∞ What is the **site of writing** for the assessment?

Course (e.g., Senior Seminar or Capstone)

ePortfolio

Other

∞ What **features** of writing focus the assessment (and how do they connect to the outcomes)?

"Traditional" values: e.g., the VALUE criteria

General rhetorical strategies: e.g., Carleton requirements

Discipline-specific values: Seattle University; UMN WEC program

Writing and reflection: e.g., Carleton

∞ Are there **opportunities to assess more than one competency**?

Critical thinking: Washington State (and a cautionary note)

Quantitative reasoning and writing: Carleton

∞ What is the process that will **establish the standards**?

DEDUCTIVE: Borrow from (and adapt?) others

INDUCTIVE: Develop standards from reviewing student writing

(Advantages and disadvantages of each)

∞ What are the **standards** that students need to meet (and why those standards)?

Texts: e.g., SUNY's coherent texts

Processes: e.g., SUNY's revising practices

∞ What's the **feedback loop**: how can your results be used to enhance the curriculum? How does the assessment become **usable and iterative**?

Change/add/delete outcomes (e.g., require writing to address separate audiences (expert and lay)

Add a new course

Re-design assignments

Coordinate assignments within a program or department

∞ Other important issues

Cost

Faculty interest

Faculty development

Student engagement

Other

WASC WRITING ASSESSMENT DESIGN PLAN

--YOUR WRITING OUTCOMES

--YOUR UNIT OF ANALYSIS/ASSESSMENT

--YOUR SITE(S) OF WRITING

--YOUR WRITING FEATURES

--ONE COMPETENCY OR MORE?

--THE PROCESS FOR ESTABLISHING THE STANDARDS (how well do students . . .)

--THE STANDARDS FOR THE OUTCOMES

← PASS/FAIL →

--THE FEEDBACK LOOP (usable and iterative)

--OTHER ISSUES

Scenarios for Assessment

SCENARIO ONE Each senior at **Capstone University** completes a formal writing assignment in the major in a capstone course; in this writing, the student is supposed to demonstrate "insider expert prose," that is the kind of writing that someone inside the discipline would write. Each department defines insider expert prose and creates a rubric representing the values of insider expert prose. The faculty member teaching the course collects the assignments, scores them with the departmental scoring guide, and then reviews the scores for areas of strengths and weaknesses. Afterwards, the faculty member presents these findings to the department for their review, discussion, and recommendations for change. Through this process, departments are making changes to enhance the curriculum. For example, the history department, unhappy with senior papers that were often narratives without theoretical sophistication, changed its sophomore-level gateway course to introduce historical theory and to develop new kinds of assignments so that students would begin learning how to apply different theoretical perspectives to historical problems and to create thesis-governed historical arguments using primary sources and archival data. The finance department has defined its capstone projects as short persuasive memos, addressed to specified audiences, arguing for a "best solution" to an ill-structured (open-ended) finance problem. Because finance professionals must frequently address lay audiences as well as finance experts, the department is especially interested in students' ability to shift audiences, constructing some arguments in an expert-to-lay context (with appropriate use of language and graphics) and some in expert-to-expert context.

SCENARIO TWO To graduate, each student at **Portfolio College** needs to create a writing portfolio; portfolios are submitted at the end of the sophomore year so that if the portfolio doesn't pass, the student has time to work on his or her writing and re-submit a portfolio. In creating the portfolio, the student must include writing from at least three general education classes and show a diversity of rhetorical strategies, including the ability to observe, to analyze complex information, to interpret, and to identify and evaluate sources. Faculty rate the portfolios every summer; students receive a no pass, pass, or extraordinary pass; typically, over 80 of the students receive a pass. Program enhancement has taken various forms: (1) anticipating that students will need to draw on their writing for the portfolio, faculty have reworked introductory courses with the portfolio in mind; (2) building on the portfolio as a foundation, three departments (classics, economics, and history) have revised their capstone projects to build specifically on the portfolio's tasks; and (3) since scores overall showed that students weren't adept at making arguments using numerical data, a workshop on writing with numbers has been offered to faculty.

SCENARIO THREE

At **Process University**, the writing program is interested in both process and product and has created two SLOs speaking to these: (1) Students will demonstrate their abilities to produce coherent texts within common college level forms (genres); (2) Students will demonstrate the ability to revise and improve such texts. As the attached definitions

Criteria	SLO 1	SLO 2
	Percentage (%)	Percentage (%)
"Exceeding"		
"Meeting"		
"Approaching"		
"Not Meeting"		

show, both outcomes are very specifically defined; these definitions are shared with students. To demonstrate these outcomes, students submit two drafts of an assignment: the student is required to highlight all the changes from draft one to draft two. A sample of these paired drafts is scored; for two years, the scores for the second SLO, on revision, have been consistently lower than those for the texts. Given the consistent pattern in this area, faculty are developing new assignments requiring specific kinds of revisions in hopes that this revising practice will transfer to all of students' formal writing.

PROCESS UNIVERSITY SLOs

1. Students will demonstrate their abilities to produce coherent texts within common college level forms

Exceeding: Writer presents an easily identifiable, focused, original, and thought provoking controlling purpose or thesis. The paper moves coherently, logically, and even creatively from an engaging introduction to a well-demonstrated conclusion. Paragraphs fit within this structure coherently and present pertinent examples and evidence to support central and subsidiary ideas. Sentence structure displays sophistication and variety; transitions add to the logical development of the topic. The essay exhibits a solid command of word variety and a tone and diction appropriate for the subject and its implied audience. Mechanics (grammar, punctuation, spelling and documentation, if needed) are nearly flawless.

Meeting: Writer presents an identifiable and focused controlling purpose or thesis. The paper moves coherently and logically from a satisfying introduction to a solid conclusion. Paragraphs fit within this structure and present examples and evidence to support the ideas presented. For the most part, sentences are well constructed and transitions are sound—though the sequence of ideas may occasionally be awkward. The essay exhibits some degree of control over the tone and diction appropriate for the subject and its implied audience. Mechanics (grammar, punctuation, spelling and documentation, if needed) are mostly accurate.

Approaching: Writer presents a wandering, vague, or unfocused controlling purpose or thesis. The paper moves awkwardly from a weak introduction to a conclusion that does not adequately represent the body of the paper. Basic paragraphing exists, but often fails to support or even recognize a central idea, and the use of evidence and examples is inadequate. Sentence and paragraph transitions are often unclear, awkward, indirect, and/or illogical. Tone and diction are often inconsistent and/or inappropriate for the subject and its implied audience. Mechanics (grammar, punctuation, spelling and documentation, if needed) are not well executed and may, at times, obscure meaning.

Not Meeting: Writer fails to present a controlling purpose or thesis; consequently it is difficult to identify exactly what the thesis is. The essay moves from an unsatisfactory introductory paragraph to an ending that does not serve as a conclusion, thus conveying the sense that much of what has been presented is unresolved. Sentence structure is often awkward and transitions are ineffectual and/or abrupt or simply missing. Diction, tone, and word choice are not appropriate for the subject or for the implied audience. Mechanics (grammar, punctuation, spelling and documentation, if needed) disrupt reading and often obscure meaning.

2. Students will demonstrate the ability to revise and improve such texts.

Exceeding: Writer demonstrates clear evidence of an ability to revise by altering content and approach, by reorganizing material, or by clarifying and strengthening the coherence of ideas. Alterations may include the addition of new material, the deletion of unhelpful material, the substitution of more relevant material for less relevant material, the strengthening of transitions, introductions, and conclusions, and the rewriting of individual sentences. The mechanics (grammar, punctuation, spelling and documentation, if needed) of the final revision are nearly flawless.

Meeting: Writer demonstrates the ability to revise by refining the content, sharpening the focus, and improving structure, clarity, and coherence. Refining content may include clearer presentation of evidence, shifting of emphasis to foreground the most relevant material, providing improved transitions that keep the focus evident, and reworking the introduction or conclusion as well as rewriting individual sentences. The mechanics (grammar, punctuation, spelling and documentation, if needed) are mostly accurate and rarely impede meaning.

Approaching: Writer demonstrates a lack of ability to revise in any substantial way. Whatever revision has been done has not been sufficient to improve the content, focus, structure, clarity, and coherence of an earlier draft. Such revision may very well be limited to sections of the essay and demonstrate a lack of awareness of how even small changes can affect the entire paper. Mechanics (grammar, punctuation, spelling and documentation, if needed) have either not improved significantly or appear to be the only focus of the revision.

Not Meeting: Writer demonstrates a lack of ability to revise at the level of content or structure. Either changes do not improve these features or are focused almost solely on mechanics.

Carleton College Writing Portfolio Scoring Sheet

Student name: _____

Student ID#: _____

Reader #: _____

Date scored: _____

Score (circle one): Needs Work Pass Exemplary

From the Carleton catalog: To guide students as they begin to work on writing at the college level, the College has developed some general criteria for good writing at Carleton. Although individual assignments, genres, or disciplines may place more or less emphasis on each criterion, faculty agree that student writing should feature the following:

	Demonstrates partially	Demonstrates adequately	Demonstrates fully
The rhetorical strategy and diction should be appropriate for the audience and purpose.			
If argument is a part of the rhetorical strategy, it should contain a thesis and develop that thesis with coherence, logic, and evidence.			
Whatever the purpose, writing should be as clear, concise, and interesting as possible.			
Narration, description, and reporting should contribute to analysis and synthesis.			
Writing should be edited to address surface error, including irregularities in grammar, syntax, diction, and punctuation.			

Comments: _____

Exploration #3: Quantitative Reasoning

Susan Elrod

Look, it's math, it's statistics, its history and psychology! It's Quantitative Reasoning!

Quantitative Reasoning: The Final Frontier of Core Competencies

Susan Elrod, Ph.D.
California State University, Chico

Hawaii Big Five-O, May 2015

Quantitative Reasoning



Quantitative Fluency

Quantitative Literacy



QR is a WSCUC CC

- The Five Core Competencies (CCs):
 - Writing
 - Oral Communication
 - **Quantitative Reasoning**
 - Critical Thinking
 - Information Literacy

In the 2013 Handbook, CFR 2.2a states that baccalaureate programs must: “**requires institutions to report on their students’ levels of performance at or near the time of graduation in five core competencies: writing, oral communication, quantitative reasoning, critical thinking, and information literacy.**”



Senior College and University Commission

Core Competencies

... are critical higher-order intellectual skills for students to develop in order to be successful at school, at work, and in their private and civic lives.

Accordingly, WSCUC’s institutional review process calls upon institutions to describe how the curriculum addresses each of these competencies, explain their learning outcomes in relation to the core competencies, and demonstrate the extent to which these outcomes are achieved.

QR is an AAC&U LEAP ELO

Quantitative reasoning is one of the **LEAP** (Liberal Education for America's Promise) Essential Learning Outcomes (or **ELOs**) developed by the Association of American Colleges & Universities (**AAC&U**), along with **inquiry and analysis, critical and creative thinking, written and oral communication, information literacy and teamwork and problem solving.**

<http://www.aacu.org/leap>



QF is in the DQP

The Lumina Foundation's Degree Qualifications Profile (**DQP**) calls this skill **quantitative fluency** and places it, like LEAP, among several important intellectual skills: **analytic inquiry, information literacy, engaging diverse perspectives, and communication fluency.**



<http://www.luminafoundation.org/resources/dqp>

Think and Share:

What does QR mean for the students in your department/
program/college?

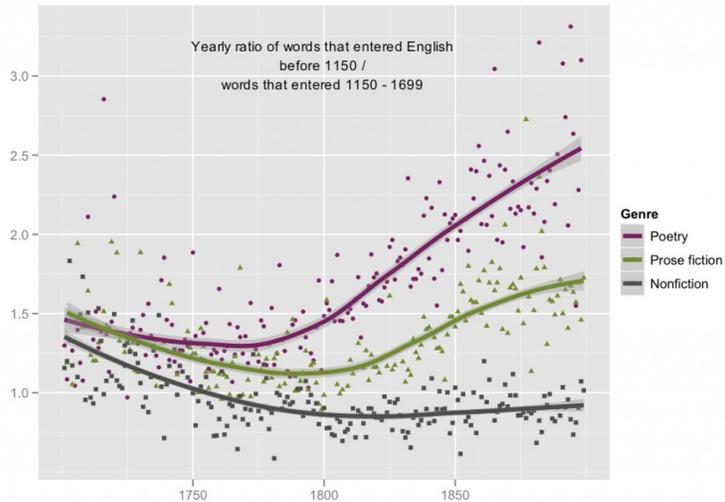
WSCUC QR Definition

- the ability to apply mathematical concepts to the interpretation and analysis of quantitative information in order to solve a wide range of problems, from those arising in pure and applied research to everyday issues and questions.
- It may include such dimensions as ability to apply math skills, judge reasonableness, communicate quantitative information, and recognize the limits of mathematical or statistical methods.

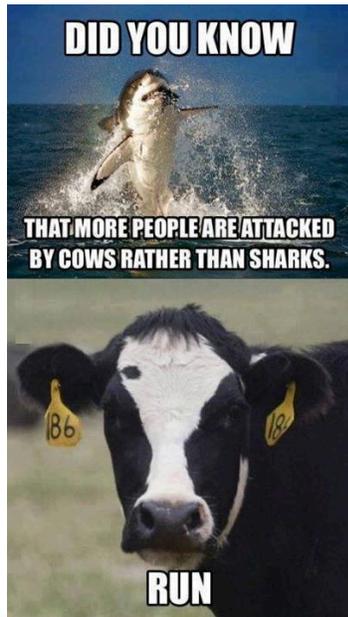
Source:

<http://www.wascenior.org/resources/handbook-accreditation-2013/part-iii-wasc-quality-assurance/institutional-report/components-institutional-report/4-educational-quality-student-learning-core-competencies-and-standards-performance>

Digital Humanities



Underwood and Sellers, J. Digital Humanities , No. 1 Vol. 2. 2012



Cows kill approximately 22 people every single year in the US. Sharks are responsible for <1 death in the US, and fewer than six worldwide.

A few more animals more likely to kill you than sharks: deer (130 deaths in the US per year), dogs (30-35 deaths in the US per year) and horses (20 deaths per year)

What conclusions can be drawn?

National Numeracy Network Definition

A comfort, competency, and "habit of mind" in working with numerical data as being as important in today's highly quantitative society as reading and writing were in previous generations.

A ability that emphasizes the higher-order reasoning and critical thinking skills needed to understand and to create sophisticated arguments supported by quantitative data

<http://serc.carleton.edu/nnn/index.html>

Vaccines and Autism Spectrum Disorders (ASD)

In 1992, Denmark and Sweden stopped using thimerosal in vaccines. This study compared the rate of ASD in these countries before and after thimerosal was removed. In both countries, ASD rates increased between 1987 and 1999. If thimerosal exposure was related to ASD, one would expect that ASD rates would decrease after 1992 when children were no longer being exposed.

Should I vaccinate my child?

Source: http://www.cdc.gov/vaccinesafety/00_pdf/CDCStudiesonVaccinesandAutism.pdf

STOP RUBELLA

Make sure every child gets the rubella vaccine



Rubella is a viral infection that spreads in airborne droplets when people sneeze or cough. If a woman gets rubella while pregnant—especially in her first 3 months—serious consequences can result, including miscarriages, fetal deaths, still births, and congenital rubella syndrome (CRS). Rubella virus is an important cause of severe birth defects.

A woman infected with rubella during the first 3 months of pregnancy has up to a

90% chance



of giving birth to a baby with congenital rubella syndrome

Or her baby may not survive.

Globally, there are more than

100,000

babies born each year with CRS

Congenital Rubella Syndrome leads to



Blindness



Deafness



Heart Disease



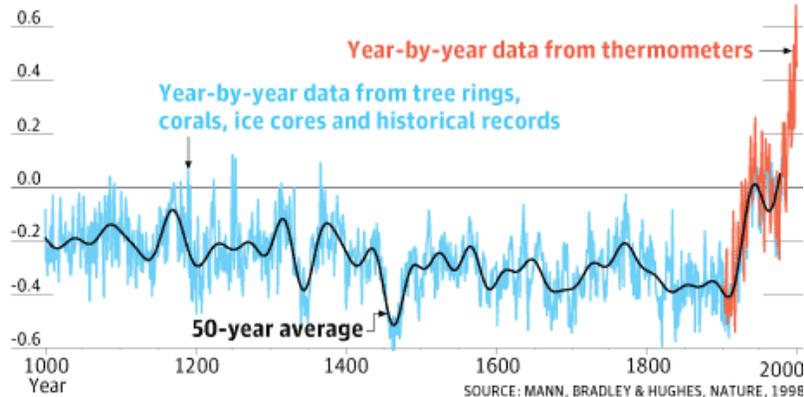
Other Birth Defects

Source: IFLScience.com

Is the Earth's climate changing?

Variations of the Earth's surface temperature

Northern hemisphere. Departures in temperature (C) from the 1961 to 1990 average



Millennials and Numeracy

- Since 2003, the percentages of U.S. millennials scoring below level 3 in numeracy (the minimum standard) increased at all levels of educational attainment.
- U.S. millennials with a four-year bachelor's degree scored higher in numeracy than their counterparts in only two countries: Poland and Spain.
- The scores of U.S. millennials whose highest level of educational attainment was either *less than high school* or *high school* were lower than those of their counterparts in almost every other participating country.
- Our best-educated millennials—those with a master's or research degree—only scored higher than their peers in Ireland, Poland, and Spain.

Source: ETS, America's Skills Challenge. 2015

Personalized Genetic Medical Data

Drug Response (24) ?

REPORT	RESULT
Warfarin (Coumadin®) Sensitivity	Increased
Response to Hepatitis C Treatment	Reduced
Fluorouracil Toxicity	Typical
Sulfonylurea Drug Clearance (Type 2 Diabetes Treatment)	Typical
Alcohol Consumption, Smoking and Risk of Esophageal Cancer	Typical

[See all 24 drug response..](#)

Health Risks (122, 1 locked report) ?

↑ ELEVATED RISKS	YOUR RISK	AVERAGE RISK
Type 2 Diabetes	28.4%	20.7%
Chronic Kidney Disease	2.7%	2.2%
Melanoma	2.4%	1.7%
Type 1 Diabetes	1.4%	1.0%
Celiac Disease	0.89%	0.24%

[See all 122 risk reports..](#)

Bitter Taste Perception	★★★★	Unlikely to Taste
Earwax Type	★★★★	Wet
Eye Color	★★★★	Likely Brown
Hair Curl 🌀	★★★★	Slightly Curlier Hair on Average
Lactose Intolerance	★★★★	Likely Tolerant
Malaria Resistance (Duffy Antigen)	★★★★	Not Resistant
Muscle Performance	★★★★	Unlikely Sprinter

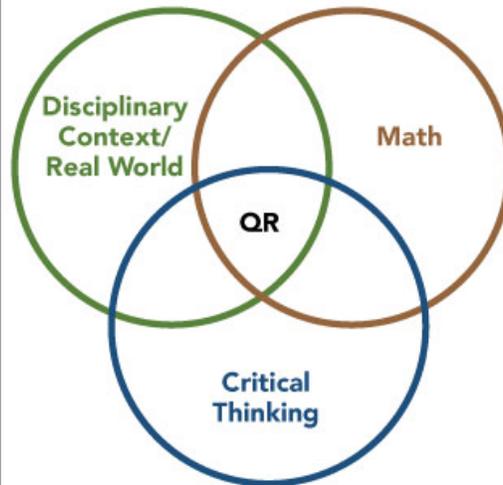
From Lumina's DQP

- Associate level:
 - Presents **accurate calculations and symbolic operations**, and **explains** how such calculations and operations are used in either his or her **specific field of study or in interpreting social and economic trends**.
- Bachelor's level:
 - Constructs **accurate and relevant calculations, estimates, risk analyses or quantitative evaluations of public information** and **presents them** in papers, projects or multi-media events.

Traditional Math	QR
Abstract, deductive discipline	Practical, robust habit of mind
Employed in professions such as sciences, technology and engineering	Employed in every aspect of an alert, informed life
Rises above context	Anchored in context
Objects of study are ideals	Objects of study are data
Serves primarily professional purposes	Is essential for all graduates' personal and civic responsibilities

From "Everything I Needed to Know about Averages. . . I Learned in College" by Lynn Arthur Steen, professor of mathematics, St. Olaf College.

Figure 1. QR within the Undergraduate Curriculum

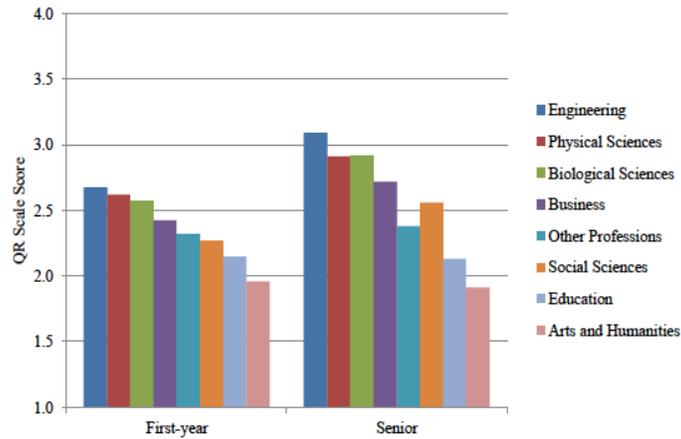


Think and Share:

Think of an example of QR in your discipline or at the upper division in GE ... *integrative, iterative, interdisciplinary.*

Write one or more outcomes for this example.

Average Frequency of QR Activities by Major and Class Level (NSSE)



Rocconi, Louis M., Amber D. Lambert, Alexander C. McCormick, and Shimon A. Sarraf. 2013. "Making College Count: An Examination of Quantitative Reasoning Activities in Higher Education." *Numeracy* 6 (2): Article 10. Available at: <http://scholarcommons.usf.edu/numeracy/vol6/iss2/art10>.

The Updated NSSE

*Engagement Indicators
more specific &
actionable!*

From Benchmarks to Engagement Indicators and High-Impact Practices

NSSE Benchmarks 2000 - 2012

**Level of
Academic
Challenge**

**Active and
Collaborative
Learning**

Key Changes

Expanded to focus on distinct dimensions of academic effort, including new topics of interest. In addition, key items on reading, writing, and study time will be reported in this theme.

Modified to emphasize student-to-student collaboration. Updated diversity items from Enriching Educational Experiences have been moved here.

Engagement Indicators

Higher-Order Learning

Reflective & Integrative Learning

Learning Strategies

Quantitative Reasoning

Theme: Academic Challenge

Collaborative Learning

Discussions with Diverse Others

Theme: Learning with Peers

Work with team/group:

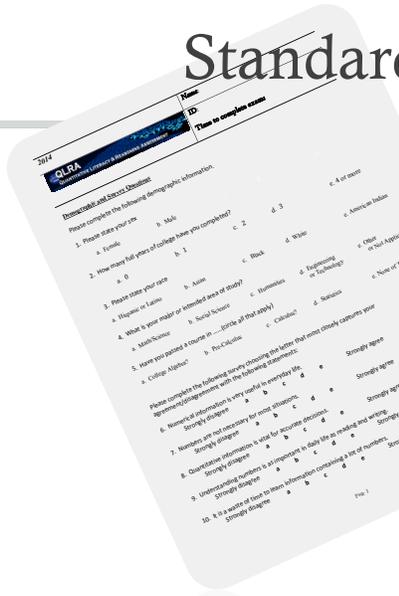
Draw a diagram that shows where you think QR fits within your university's curriculum.

Share with your table/draw on flip chart paper.

Quantitative Reasoning Encounters (QREs) at Carleton College

- Students complete **three** courses that have been designated as providing quantitative reasoning encounters (QRE).
- The goal of the requirement is to increase students' appreciation for the power of QR and to enhance their ability to evaluate, construct, and communicate arguments using quantitative information.
- A course designated as a QRE will include at least one substantial assignment or module designed to enhance one or more of the following QR skills:
 - Possessing the habit of mind to consider what numerical evidence might add to the analysis of a problem;
 - Identifying appropriate quantitative or numerical evidence to address a question;
 - Locating or collecting numerical or quantitative data;
 - Interpreting numerical evidence properly including recognizing the limitations of methods and sources used;
 - Effectively communicating arguments that involve numerical or quantitative evidence.

Standardized Tests



• Sundre, Donna L. 2008. **The Quantitative Reasoning Test, Version 9: Test Manual.** Harrisonburg, VA: Center for Assessment and Research Studies.

• Gaze, Eric, *et al.*, **Quantitative Literacy and Reasoning Assessment (QLRA):** <http://serc.carleton.edu/qlra/index.html>

• **National Assessment of Adult Literacy:** <http://nces.ed.gov/naal/>

AAC&U's VALUE Rubric

QUANTITATIVE LITERACY VALUE RUBRIC
for more information, please contact rubric@aacu.org

Definition
Quantitative Literacy (QL) - also known as Numeracy or Quantitative Reasoning (QR) - is a "habit of mind" competency, and conduct in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of forums (using words, tables, graphs, mathematical equations, etc. as appropriate).

Evaluators are encouraged to assign a score to any work sample or collection of work that does not meet benchmark (all are) final performance.

	4	3	2	1	Benchmark
Interpretation <i>(Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words))</i>	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.	Provides accurate explanations of information presented in mathematical forms. For instance, accurately explains the trend data shown in a graph.	Provides somewhat accurate explanations of information presented in mathematical forms, but does not accurately explain the trend data shown in a graph. For instance, accurately explains trend data shown in a graph, but may misstate the slope of the trend line.	Attempts to explain information presented in mathematical forms, but does not accurately explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by implying positive and negative trends.	Attempts to explain information presented in mathematical forms, but does not accurately explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by implying positive and negative trends.
Representation <i>(Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words))</i>	Skilfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and detailed mathematical portrayal.	Converts information into a mathematical portrayal, but the portrayal is only partially appropriate or accurate.	Attempts to convert information but resulting mathematical portrayal is inappropriate or inaccurate.	Calculations are attempted but are both unsuccessful and are not comprehensive.
Calculation	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are on other unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations attempted are on other unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations attempted are on other unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.
Application / Analysis <i>(Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of that analysis)</i>	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for weak/unstable (without interpretation or nuance, or subjective) judgments, drawing plausible conclusions from this work.	Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.	Explicitly describes assumptions.
Assumptions <i>(Ability to make and evaluate important assumptions in collection, modeling, and data analysis)</i>	Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explains it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explanation may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (Use of quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)
Communication <i>(Expressing quantitative evidence in support of the argument or purpose of the work in terms of what evidence is used and how it is presented, organized, and understood)</i>	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explains it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explanation may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (Use of quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (Use of quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)

Rubric for QR in Writing

Quantitative Reasoning in Student Writing Rating Sheet

Student ID #: _____ Reader ID #: _____

I. Identification.

II. Is QR potentially relevant to this paper? (Sign potential common of paper, not the assignment)

___ NO or incidentally only ___ YES, but peripherally only ___ YES, centrally

III. What is the extent of numerical evidence and quantitative reasoning present in the paper?
[See "Employs QR Genera"; Note: This is not a rating of the quality of the QR shown, only its presence.]

___ rating of 1-3, review attached criteria

IV. OVERALL ASSESSMENT of Quality of Implementation, Interpretation, and communication of QR:

___ rating of 1-4, review attached criteria

V. Problematic characteristics of the QR present in the paper: (check all issues that detract significantly from the reader's understanding of the information presented.)

- ___ Uses ambiguous words rather than numbers.
- ___ Fails to provide numbers that would contextualize the argument.
- ___ Fails to describe own or others' data collection methods.
- ___ Doesn't evaluate source or methods' credibility and limitation.
- ___ Inadequate scholarship on the origins of quantitative information cited.
- ___ Makes an unsupported claim about the causal meaning of findings.
- ___ Presents numbers without comparisons that might give them meaning.
- ___ Presents numbers but doesn't weave them into a coherent argument.

VI. Does the assignment explicitly call for the use of QR in the paper?

___ YES ___ NO ___ NO ASSIGNMENT PRESENT

Grawe, Nathan D., Neil S. Lutsky, and Christopher J. Tassava. 2010. "A Rubric for Assessing Quantitative Reasoning in Written Arguments." *Numeracy* 3 (1), <http://services.bepress.com/numeracy/vol3/iss1/art3>.

Work with team/group:

Go back to the outcome(s) you wrote.

Now connect it to an assessment method.

Performance Standards

Discuss how this will lead to setting standard(s) of performance for students at your college/university.

Include how you would measure student performance for the standard(s).

Challenges to Implementing QR

- **Curriculum:** Making sure it is part of the curriculum
- **Faculty Development:** Faculty in all disciplines need professional development support to enhance QR in their courses
- **Assessment:** QR being included in program/institutional assessment activities
- **Need:** Administrators, faculty and policy makers insufficiently aware of the increasing need for QR

2001 Study by Mathematical Association of America (MAA)

Quantitative Reasoning Program at Bowdoin College

- **Assessing** first-year students' quantitative literacy
- **Advising** students regarding appropriate quantitative courses
- Establishing **study groups** for quantitative courses
- Providing **individual tutoring** for students in quantitative courses
- Offering **supplemental support** to quantitative courses



<http://www.bowdoin.edu/qr-program/>

Next Steps

What?	When?	Resources?	Who?
1.			
2.			
3.			

WASC Retreat on the Five Core Competencies
Look, it's math, it's statistics, its history and psychology! It's Quantitative Reasoning!
Quantitative Reasoning: The Final Frontier of Core Competencies

Susan Elrod, Ph.D.

California State University, Chico

1. Activity: What does QR mean for the students in your department/program/college?

2. Activity: Think of an example of QR in your discipline or in upper division GE ... *integrative, iterative, interdisciplinary*. Write one or more outcomes for this example. Share with your table.

3. Activity: Draw a diagram that shows where you think QR fits within your university's curriculum. Share with your table/draw on flip chart paper.

4. Activity: Go back to the outcome(s) you wrote. Now connect it to an assessment method. Discuss how this will lead to setting standard(s) of performance for students at your college/university. Include how you would measure student performance for the standard(s).

Outcome	Assessment Method	Standard of Performance
1.		
2.		

5. Activity: Next Steps for your campus

A. What needs to get done?	B. When will it happen?	C. What will we need to get it done? (available and new resources)	D. Who will be responsible?
1.			
2.			
3.			

Exploration #4: Information Literacy

Jennifer Fabbi

Creating Context for Information Literacy: Best Practices for Learning and Assessment

May 20, 2015

Dr. Jennifer Fabbi

California State University San Marcos

WSC | EDUCATIONAL
Senior College and
University Commission PROGRAMS

What does information literacy mean to your campus?

At your tables, please discuss the following questions:

- * What is information literacy?
- * Does our campus call it information literacy?
- * Do we have a campus-wide learning outcome for information literacy?
- * Where do students learn information literacy competencies?

What is information literacy?

... and it was the same, but different

“Information literacy is a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.”

Information Literacy Competency Standards for Higher Education, 2000

“Information literacy is a repertoire of understandings, practices, and dispositions focused on flexible engagement with the information ecosystem, underpinned by critical self-reflection. The repertoire involves finding, evaluating, interpreting, managing, and using information to answer questions and develop new ones; and creating new knowledge through ethical participation in communities of learning, scholarship, and practice.”

Framework for Information Literacy, 2015

Do we call it information literacy?

University Undergraduate Learning Outcomes (UULOs)

- * Intellectual Breadth and Lifelong Learning
- * Inquiry and Critical Thinking ←
- * Communication
- * Global/Multicultural Knowledge and Awareness
- * Citizenship and Ethics

UNLV

Do we call it information literacy?

Inquiry & Critical Thinking

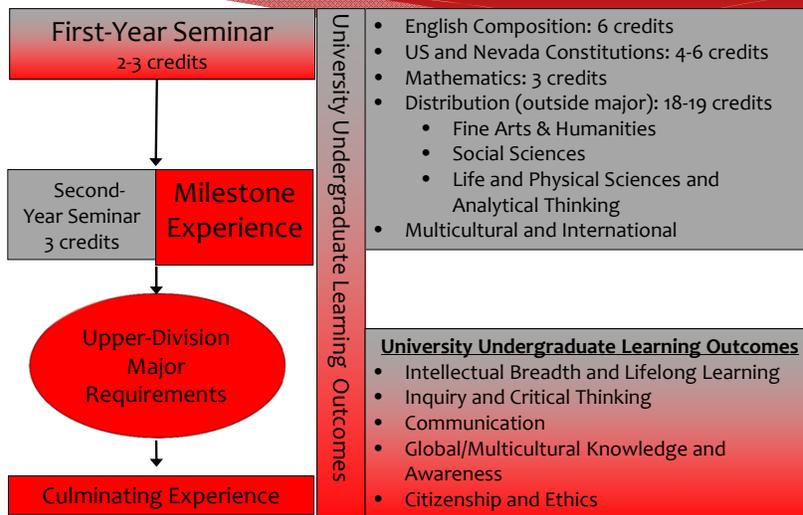
Students should be able to identify problems, articulate questions, and use various forms of research and reasoning to guide collection, analysis, and use of information related to those problems.

Competence in the Inquiry and Critical Thinking outcome is defined by the following objectives:

1. Identify problems, articulate questions or hypotheses, and determine the need for information.
2. Access and collect the needed information from appropriate primary and secondary sources.
3. Use quantitative and qualitative methods, including the ability to recognize assumptions, draw inferences, make deductions, and interpret information to analyze problems in context and draw conclusions.
4. Recognize complexity of problems and identify different perspectives from which problems and questions can be viewed.
5. Evaluate and report on conclusions, including discussing the basis for and strength of findings, and identify areas where further inquiry is needed.
6. Identify, analyze, and evaluate reasoning and construct and defend reasonable arguments and explanations.



Vertical General Education Model



Color code: Gen Ed Gen Ed/Major Major

<http://generaled.unlv.edu/>

Scaffolding IL Competencies

UULO Two: Inquiry and Critical Thinking – Use qualitative and quantitative methods to guide the collection, analysis, and use of information and produce reasoned arguments and explanations.

Objective One: Identify problems, articulate questions or hypotheses, and determine the need for information.

Beginning	Middle (Beginning+)	End (Beginning/Middle+)
Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need. (1.1.A.)	Develops a thesis statement and formulates questions based on the information need. (1.1.B.)	Reviews the initial information need to clarify, revise, or refine the question. (1.4.A.)
Identifies key concepts and terms that describe the information need. (1.1.E.)	Defines or modifies the information need to achieve a manageable focus. (1.1.D.)	Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information. (1.1.F.)
Explores general information sources to increase familiarity with the topic. (1.1.C.)		

Scaffolding IL Competencies

Home | First Year Seminar | **English 102** | Sophomore/Junior-Level Courses | Senior-Level Courses | Digital Learning Objects

English 102 | Comments(0) | Print Page | Search: | This Guide | Search

Lesson Plans

 [Blank Lesson Plan Template](#)
Comments (0)

Outcome #1 Identify problems, articulate questions or hypotheses, and determine the need for information

Learning Activities:

- Apply "who-what-where-when" approach to focus research topic via the Topic Narrowing Tutorial
- Other pre-research activities tied to the tutorial:
 - Look for background information and vocabulary in Wikipedia or CQ Researcher
- Peer coaches lead students in group work to provide feedback on research questions

Comments (0)

Outcome #2 Access and collect the needed information from appropriate primary and secondary sources

Learning Activities:

- Use Academic Search Premier to find information and generate citations
- Practice keyword searching strategies
- Apply basic search filters
- Identify elements of a citation

Comments (0)

Undergraduate Learning Librarian



Erin Rinto

Contact Info
LLB 1186
4505 S. Maryland Parkway, Box 457014
(702) 895-2103
[Send Email](#)

Links:
[Profile & Guides](#)

Subjects:
[English Composition](#)

Comments (0)



Practicing Increasingly Sophisticated Skills

WORKSHEET 2	PROGRAM VIEW -- PROPOSED (ACRL STANDARDS)									
	COURSE NAME									
	INSTRUCTION METHOD									
1. Determines the nature and extent of the information needed										
1.1	Defines and articulates the need for information									
1.2	Identifies a variety of types and formats of potential sources for information									
1.3	Considers the costs and benefits of acquiring the needed information									
1.4	Reevaluates the nature and extent of the information need.									
2. Accesses needed information effectively and efficiently										
2.1	Selects the most appropriate investigative methods or information retrieval systems for accessing the needed information									
2.2	Constructs and implements effectively-designed search strategies									
2.3	Retrieves information online or in person using a variety of methods									
2.4	Refines the search strategy if necessary									
2.5	Extracts, records, and manages the information and its sources									
3. Evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.										
3.1	Summarizes the main ideas to be extracted from the information gathered									

Faculty Development Institutes



<https://www.library.unlv.edu/faculty/institute/>

UNLV UNIVERSITY LIBRARIES

A Word About the IL Framework

Use of **Threshold Concepts**: “A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress. As a consequence of comprehending a threshold concept there may thus be a transformed internal view of subject matter, subject landscape, or even world view. This transformation may be sudden or it may be protracted over a considerable period of time, with the transition to understanding proving troublesome.”

Meyer and Land, 2003

A Word About the IL Framework

Six Frames:

- * Authority is Constructed and Contextual
- * Information Creation as a Process
- * Information Has Value
- * Research as Inquiry
- * Scholarship as Conversation
- * Searching as Strategic Exploration

A Word About the IL Framework

A Roadmap for assessing IL using the Framework

1. Adapt for your campus environment.
2. Transform into learning outcomes.
3. Get buy in.
4. Design curriculum with the end in mind.
5. Map the context.
6. Deploy instruction.
7. Collect evidence of learning.
8. Know what you are looking for.
9. Report your data.
10. Close the loop.

Oakleaf, 2014

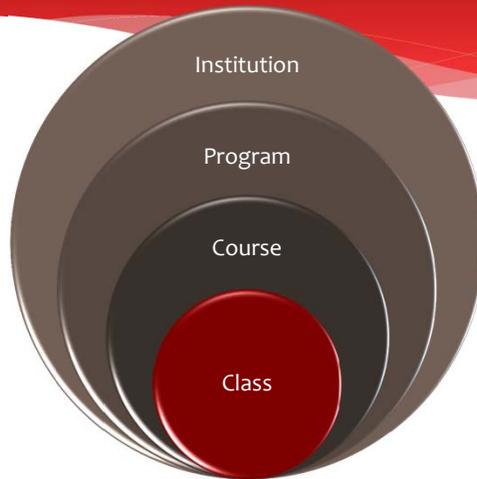
Activity 1

Timelining IL Learning at our Institution

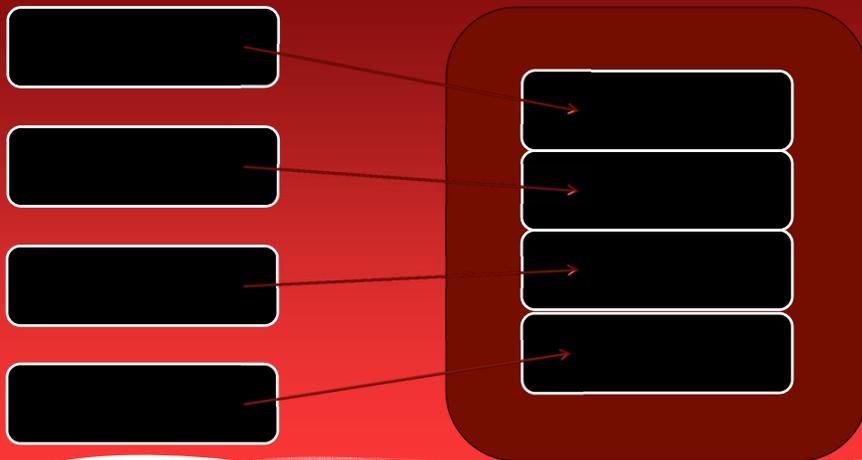
Where does information literacy learning occur at your institution?

<input type="radio"/>	Where students are currently practicing information literacy competencies
<input checked="" type="radio"/>	Where students are currently assessed on information literacy competencies
<input type="radio"/>	★ Optimal placement for information literacy learning and assessment

Differentiated Levels of Assessment



Differentiated Levels of Assessment



Course View

Programmatic View

Scaling “Authentic” Assessment

NATALIE PRESENTS: THE DEFINITION OF “RANDOM”



RANDOM: Made, done, happening or chosen without method or conscious decision.

Today, use “random” correctly in a sentence. (HINT: things you don’t understand and jokes you don’t get are not random.)

Rubrics



- * Require time
- * May have validity and reliability issues
- * Assume the product reveals the process
- * Can be authentic assessment
- * Can have strong alignment with your outcomes and goals

Rubrics



Standardized Tests



- * May not align with your outcomes and goals
- * May be hard to motivate students
- * Require money and space and maybe technology resources
- * Can make comparisons across time and groups easier
- * Usually require less time from your faculty and staff

Standardized Tests



THRESHOLD ACHIEVEMENT



Activity 2 Interpreting and Using IL Assessment Data

Each table has a number 1 or 2

- 1: iSkills report
- 2: Rubric data

- * What are your data limitations?
- * What decisions can you make?
- * What actions can you take?
- * How can you address WASC standards?

Coherence: What is it?

... defined as an educational program “where students are able to make connections and integrate their knowledge, rather than one that merely provides them with isolated pieces of information. These connections should occur within disciplines, among disciplines, to real life and the world, and to majors and careers.”

Kenneth Boning. (2007). “Coherence in general education: A historical look.”
Journal of General Education, 56(1), 1-16.

High-Impact Educational Practices

- * First-Year Seminars and Experiences
- * Common Intellectual Experiences
- * Learning Communities
- * Writing-Intensive Courses
- * Collaborative Assignments and Projects
- * Undergraduate Research
- * Diversity/Global Learning
- * Service Learning, Community-Based Learning
- * Internships
- * Capstone Courses and Projects

Source: High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter by George D. Kuh, (Washington, DC: AAC&U, 2008). For information and more resources and research from LEAP, see www.aacu.org/leap.

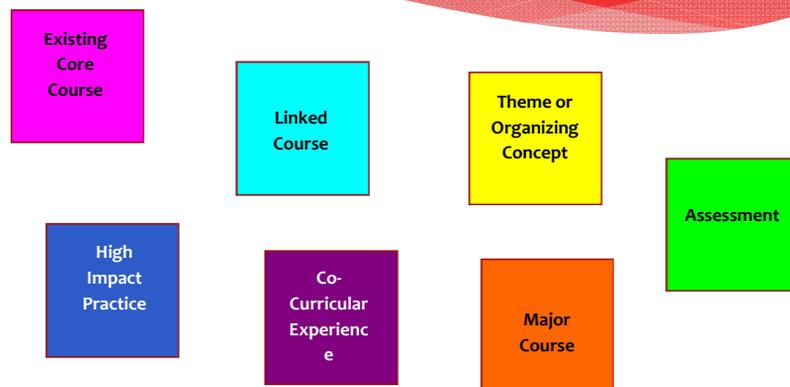
Activity 3

Constructing a Coherent Pathway

- * Use the provided materials to construct both a short-term (one year) model and a long-term (5 years) model for integrating information literacy into students' experiences at your institution.
- * Elements may include: a theme or organizing concept, existing core courses, linked courses, high-impact educational practices, and co-curricular experiences.
- * Don't forget to indicate how student learning will be assessed!
- * You will be asked to present your models to the rest of the group.

Activity 3

Constructing a Coherent Pathway



Questions?



jennifer.fabbi@gmail.com

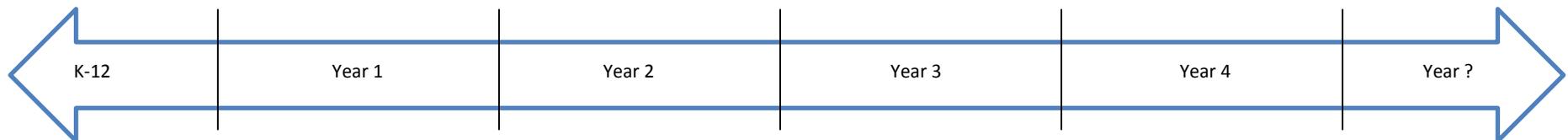
Activity 1: Timelining Information Literacy at Your Institution

Based on your understanding of what information literacy means in the context of your university, where does the teaching of those skills take place? When are students taught information literacy? When are they asked to demonstrate it (in other words, where are they assessed)?

Think of the student experience as a timeline, that includes K-12 education, undergraduate education, and beyond (graduate school or employment). What classes do they take, and in which order? How is information literacy taught and assessed in those courses?

Using the following instructions, indicate on the blank timeline where students are taught and assessed elements of information literacy, and consider if this is the optimal place in the degree program for where these learning outcomes should be taught and assessed.

O	<i>Where students are currently practicing information literacy competencies</i>
X	<i>Where students are currently assessed on information literacy competencies</i>
★	<i>Optimal placement for information literacy learning and assessment</i>



“Many researchers (and research texts) suggest that the first column within the table should suffice (Confidence Level = 95%, Margin of Error = 5%). To use these values, simply determine the size of the population down the left most column (use the next highest value if your exact population size is not listed). The value in the next column is the sample size that is required to generate a Margin of Error of $\pm 5\%$ for any population proportion.

“However, a 10% interval may be considered unreasonably large. Should more precision be required (i.e., a smaller, more useful Margin of Error) or greater confidence is desired (0.01), the other columns of the table should be employed.” – Research Advisors

Required Sample Size[†]

Population Size	Confidence = 95%				Confidence = 99%			
	Margin of Error				Margin of Error			
	5.0%	3.5%	2.5%	1.0%	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10	10	10	10	10
20	19	20	20	20	19	20	20	20
30	28	29	29	30	29	29	30	30
50	44	47	48	50	47	48	49	50
75	63	69	72	74	67	71	73	75
100	80	89	94	99	87	93	96	99
150	108	126	137	148	122	135	142	149
200	132	160	177	196	154	174	186	198
250	152	190	215	244	182	211	229	246
300	169	217	251	291	207	246	270	295
400	196	265	318	384	250	309	348	391
500	217	306	377	475	285	365	421	485
600	234	340	432	565	315	416	490	579
700	248	370	481	653	341	462	554	672
800	260	396	526	739	363	503	615	763
1,000	278	440	606	906	399	575	727	943
1,200	291	474	674	1067	427	636	827	1119
1,500	306	515	759	1297	460	712	959	1376
2,000	322	563	869	1655	498	808	1141	1785
2,500	333	597	952	1984	524	879	1288	2173
3,500	346	641	1068	2565	558	977	1510	2890
5,000	357	678	1176	3288	586	1066	1734	3842
7,500	365	710	1275	4211	610	1147	1960	5165
10,000	370	727	1332	4899	622	1193	2098	6239
25,000	378	760	1448	6939	646	1285	2399	9972
50,000	381	772	1491	8056	655	1318	2520	12455
75,000	382	776	1506	8514	658	1330	2563	13583
100,000	383	778	1513	8762	659	1336	2585	14227
250,000	384	782	1527	9248	662	1347	2626	15555
500,000	384	783	1532	9423	663	1350	2640	16055
1,000,000	384	783	1534	9512	663	1352	2647	16317
2,500,000	384	784	1536	9567	663	1353	2651	16478
10,000,000	384	784	1536	9594	663	1354	2653	16560
100,000,000	384	784	1537	9603	663	1354	2654	16584
300,000,000	384	784	1537	9603	663	1354	2654	16586

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<http://www.research-advisors.com/tools/SampleSize.htm>

I'd like to acknowledge Megan Oakleaf, Associate Professor in the School of Information Studies at Syracuse University, who introduced me to this Sample Size table.

Interrater Reliability

These are Rubric Criteria and Descriptors for the Outcomes “Define Information Need,” “Locate Information,” and “Evaluate Information” at College X where librarians and faculty are working on assessing seniors’ information literacy. Raters used this rubric to evaluate students’ papers and research journals.

Instructions:

- 1) a. **Circle** each criterion you think raters often **disagreed** about. b. Put a **star** next to each criterion you think raters often **agreed** on. c. Put a question mark next to each criterion you’re not sure whether raters would have agreed or disagreed about.
- 2) When you’re finished making your marks, share your responses with a partner and discuss possible reasons for similarities and differences in your analyses.
- 3) Try re-writing one of the criteria/descriptors you think raters were likely to disagree about?

Criteria	Descriptor	Descriptor	Descriptor	Descriptor
	Performance Level 3	Performance Level 2	Performance Level 1	Performance Level 0
Defines Research Topic/ Thesis Statement	Student defines a multi-faceted research topic/thesis statement with a developed relationship between/among facets.	Student defines a multi-faceted research topic/thesis statement without a developed relationship between/among facets.	Student defines a single-faceted research topic/thesis statement, or is too broad/narrow.	Student does not define a research topic /thesis statement.
Determines Key Concepts	Student determines multiple key concepts that reflect the research topic/thesis statement accurately.	Student determines some concepts that reflect the research topic/thesis statement, but concept breakdown is incomplete.	Student determines concepts that reflect the research topic/thesis statement inaccurately.	Student does not determine any concepts that describe the research question/thesis statement.
Uses Keywords	Student uses keywords that completely describe the research topic/thesis statement.	Student uses keywords that partially describe the research topic/thesis statement.	Student uses keywords that are inappropriate or misspelled.	Student does not show evidence of using keywords.
Identifies Relevant Types of Sources	Student uses subject-specific databases appropriately matched to the target assignment.	Student uses non-subject-specific databases appropriately matched to the target assignment (ex. Academic Search Premier, LexisNexis, National Newspapers).	Student uses free web or non-article database sources (ex. Google, encyclopedia), and/or sources are not appropriately matched to the target assignment (ex.	Student does not show evidence of using information sources.
Uses Database Search Features	Student applies multiple appropriate search terms and Boolean search strategies as well as wildcard/truncation searching; phrase searching; field searching; or other features.	Student applies multiple appropriate search terms and appropriate Boolean search strategies.	Student applies search terms and simple/basic keyword search strategies and/or uses inappropriate Boolean strategies.	Student does not show evidence of applying search terms.

Applies Evaluative Criteria – Currency	Student states source currency or publication date and accurately assesses the appropriateness in the context of research topic/thesis statement.	Student states source currency or publication date, but inaccurately assesses the appropriateness in the context of research topic/thesis statement.	Student states source currency or publication date, but does not assess the appropriateness in the context of the research topic/thesis statement.	Student does not address source currency or publication date.
Applies Evaluative Criteria – Authority	Student articulates author's credentials accurately, in context of research topic/thesis statement.	Student articulates author's credentials accurately, without context of research topic/thesis statement.	Student provides an inaccurate analysis of author's credentials.	Student does not identify author's credentials.
Applies Evaluative Criteria – Credibility	Student identifies evidence of source credibility accurately, in context of research topic/thesis statement.	Student identifies evidence of source credibility accurately, but without context of research topic/thesis statement.	Student provides inaccurate evidence of source credibility.	Student does not provide evidence of source credibility.
Applies Evaluative Criteria – Relevance	Student describes the relevance of the source with specific examples from the text, in context of research topic/thesis statement.	Student describes the relevance of the source, in context of research topic/thesis statement.	Student states the relevance of the source, but without context of research topic/thesis statement.	Student does not address the relevance of the source; may summarize the source.

Comparing Standardized Tests for Large-Scale Assessment

Test Name	Item Types	Cost	Intentionally tests IL constructs	Happens to test IL constructs	Time	Format	Reports*	Customizable
SAILS	Fixed-choice	\$4/student	X		35 minutes	paper or online	Norm	no
EPP (was MAAP)	Fixed-choice (can add Essay)	\$13.50-\$15.50/student		X	40-120 minutes	paper or online	Norm and Criterion	yes
CAAP	Fixed-choice and Essay	\$14-\$21/student		X	40 minutes/module	paper	Norm	yes
iSkills	Performance Tasks	\$22-\$33/student	X		75 minutes	online	Norm	yes
CLA	Performance Tasks	\$7000 for first 100 students; \$25/student for each add.		X	90 minutes performance 75 minutes writing	online	Norm	no
CAT	Short Answer	\$6/student + \$200 fee + faculty time for scoring		X	60 minutes	paper	Faculty Scored	no

* Norm Referenced tests compare students' performance to other students (like the SAT does) rather than to a defined performance level. This means that they may not align with your local standards. In order to report these results in your self-study, you will need to interpret the report to determine if students' performance met the criteria you have set for your graduates.

Criterion Referenced tests report students' results in terms of how well they met the standards established by the test-makers. These results may be easier to interpret in terms of your institution's performance standards since reports usually show whether students are advanced, proficient, or developing in the test areas.

Sources:

Gulek, C. (2003). Preparing for high-stakes testing. *Theory into Practice, 42*(1), 42-50.

Millett, C. M., Stickler, L. M., Payne, D. G., and Dwyer, C. A. (2007). A culture of evidence: Critical features of assessments for postsecondary student learning. *Educational Testing Service*. Retrieved September 15, 2013, from http://www.ets.org/culture_evidence

Mort, D. L. (2010). The assessment smorgasbord. *Assessment Update, 22*(1), 11-12.

Stein, B., & Haynes, A. (2011). Engaging faculty in the assessment and improvement of students' critical thinking using the critical thinking assessment test. *Change, 43*(2), 44-49. doi:10.1080/00091383.2011.550254

And special thanks to Patty Iannuzzi for her additional information about standardized tests.

Based on the iSkills Aggregate Task Performance Feedback Report (see a sample at https://www.ets.org/Media/Tests/ICT_Literacy/pdf/iSkills_Aggregate_Task_Sample_Report.pdf)

What students were asked to do	Feedback on highest scoring response	# of your students who provided highest scoring response	% of your students who provided highest-scoring response [N=1446]	% in reference group who provided highest scoring response [N=2556 from a Four-Year College]
Skill Area	DEFINE			
Choose a research topic according to specific criteria and explain your choice	You chose a research topic that fulfilled all of the criteria given	679	47%	52%
	You correctly reported the criteria fulfilled by the research topic selected	491	34%	48%
Answer three questions to clarify a research project	You selected the best initial question to help clarify the project	1229	85%	32%
	You selected the best database variable to provide useful information for the project	1142	79%	24%
	You chose the best research question	983	68%	25%
Skill Area	ACCESS			
Search a store's database in response to a customer's inquiry	You chose the correct store database on your first search	1338	96%	68%
	You chose the best search expression for the category selected	1455	90%	85%

I'd like to acknowledge Megan Oakleaf, Associate Professor in the School of Information Studies at Syracuse University, from whom I adapted this exercise.

	You selected all of the appropriate items for the customer		795	55%	78%
	You did not select any inappropriate items for the customer		404	28%	10%
Locate two web pages for a research project	You used search terms that were precise and useful in your web searches		910	63%	76%
	You received a high percentage of relevant returns in one or two searches		57	4%	2%
Skill Area	EVALUATE				
Evaluate a database in order to determine its usefulness for a project about opposing viewpoints	You evaluated the database correctly and selected sources with authority and objectivity		896	62%	76%
	You selected current sources from the database		752	52%	74%
	You selected relevant sources from the database		694	48%	65%
	You correctly determined whether the database was useful for your project and selected the best articles		549	38%	53%
	You correctly evaluated the usefulness of the database without needing explicit criteria		1128	78%	78%
Judge the usefulness of web pages for a research project	You selected the best web pages to visit the first time they were returned in a web search		520	36%	62%

	You chose the best web pages as most useful for the research project		217	15%	63%
Skill Area	MANAGE				
Fill in an organizational chart to reflect the structure of a new business	You represented all required elements in the organizational chart		1157	80%	42%
	You represented all elements in the right relationships		1113	77%	43%
	You appropriately deleted unused cells		1127	78%	37%
Organize files into folders on a hard drive	You moved all files into proper folders		303	21%	15%
	You deleted all unnecessary folders		506	35%	24%
Skill Area	INTEGRATE				
Fill out a spreadsheet in order to determine the season records of teams in a volleyball league	You selected proper headings for spreadsheet rows and columns		1026	71%	73%
	You represented information in spreadsheet cells accurately		1041	72%	57%
	You accurately interpreted the information presented		1041	72%	41%
Complete a table comparing potential checking accounts according to specific criteria	You selected correct column headings for the table		694	48%	82%
	You accurately represented information in the table		896	62%	74%
	You ranked the checking accounts correctly		998	69%	50%

Skill Area	CREATE				
Create a slide for a group presentation	You chose the best layout to create the slide		925	64%	40%
	You chose the best title for the slide		1229	85%	38%
	You chose the best text for the slide		145	10%	13%
	You chose the best image for the slide		1142	79%	63%
	You formatted the finished slide effectively		636	44%	25%
Skill Area	COMMUNICATE				
Select and organize slides for two distinct presentations to different audiences	You selected the best slides and titles for the first presentation		145	10%	10%
	You sequenced the slides correctly for the first presentation		390	27%	15%
	You selected the best slides and titles for the second presentation		477	33%	16%
	You sequenced the slides correctly for the second presentation		636	44%	45%
	You made a correct decision regarding the delivery mode for the two presentations		752	52%	46%
	You indicated an awareness of the different needs of the two audiences		57	4%	4%

Group Discussion Questions

Look through this iSkills report with your group and imagine you are all colleagues at the institution where this assessment was administered. You've been asked to interpret these results and offer a preliminary report for the WASC self-study.

Some things to know about your institution:

Your University's Institutional Student Learning Outcome for IL: Upon graduation from YU, students will know when they need information and they will be able to identify, locate, evaluate, and effectively and responsibly use and share the information they find to solve the problem at hand. (Adapted from AAC&U)

This test was administered to undergraduate students enrolled in capstone courses. There are 3300 students enrolled in capstone courses. Students participating in this assessment were volunteers and some may have received incentives for their participation.

Consider the following 4 excerpts from the standards during your discussion:

- A. Standard 1.2 Educational objectives are clearly recognized throughout the institution and are consistent with the [published mission statement that clearly describes its purposes]. The institution **develops indicators for the achievement of its [...] educational objectives** at the institutional [...] level. The institution **has a system of measuring student achievement, in terms of [...] student learning**. The institution makes public data on student achievement at the institutional and degree level, in a manner determined by the institution.
- B. Standard 2.2a Baccalaureate programs [...] **ensure the development of core learning abilities and competencies** including, but not limited to, college-level written and oral communication; college-level quantitative skills; **information literacy**; and the habit of critical analysis of data and argument. [...]
- C. Standard 2.6 The institution demonstrates that its **graduates consistently achieve its stated levels of attainment** and ensures that its expectations for student learning are embedded in the standards faculty use to evaluate student work.

- D. Standard 4.4 The institution employs a deliberate set of quality assurance processes [that] include **assessing effectiveness, tracking results over time, and using comparative data** from external sources and improving [...] curricula and pedagogy.

Analysis Questions:

How well did students do? How do they compare with other students?

Application Questions:

What can you do with these results?

1. – What decisions can you make?
2. – What actions can you take?
3. – How can you address the WASC standards excerpted above?

Bonus Question:

What additional data/resources would you want to have access to in order to make these iSkills results useful? Do you have those at your campus?

Including criteria, student performance (n=100), and interrater reliability for 11 raters.

Your University's Institutional Student Learning Outcome for IL: Upon graduation from YU, students will know when they need information and they will be able to identify, locate, evaluate, and effectively and responsibly use and share the information they find to solve the problem at hand. (Adapted from AAC&U)

Portfolios were collected from undergraduate capstone courses. There are 3300 students enrolled in capstone courses. Instructors participating in this assessment were volunteers and some may have received incentives for their participation.

Instructions:

- 1) Read through this report of assessment results. Make a note of patterns in how students performed and consider what it means that some criteria had low interrater reliability (those are the white rows).
- 2) After finishing your own analysis, discuss the following questions with a partner and then with your table:
 - What can you do with these results? What are your limitations when using these results?
 - What decisions can you make?
 - What actions can you take?

	Performance Level 3	Performance Level 2	Performance Level 1	Performance Level 0
Defines Research Topic/ Thesis Statement	Student defines a multi-faceted research topic/thesis statement with a developed relationship between/among facets.	Student defines a multi-faceted research topic/thesis statement without a developed relationship between/among facets.	Student defines a single-faceted research topic/thesis statement, or is too broad/narrow.	Student does not define a research topic /thesis statement.
% Students (n=100)	46%	31%	23%	0%
Determines Key Concepts	Student determines multiple key concepts that reflect the research topic/thesis statement accurately.	Student determines some concepts that reflect the research topic/thesis statement, but concept breakdown is incomplete.	Student determines concepts that reflect the research topic/thesis statement inaccurately.	Student does not determine any concepts that describe the research question/thesis statement.
% Students (n=100)	48%	45%	7%	0%
Uses Keywords	Student uses keywords that completely describe the research topic/thesis statement.	Student uses keywords that partially describe the research topic/thesis statement.	Student uses keywords that are inappropriate or misspelled.	Student does not show evidence of using keywords.
% Students (n=100)	33%	55%	8%	4%

More rubrics available at: <http://railsontrack.info/rubrics.aspx>

The results used here are based on research by Megan Oakleaf, MLS, PhD | meganoakleaf.info | moakleaf@syr.edu

Identifies Relevant Types of Sources	Student uses subject-specific databases appropriately matched to the target assignment.	Student uses non-subject-specific databases appropriately matched to the target assignment (ex. Academic Search Premier, LexisNexis, National Newspapers).	Student uses free web or non-article database information sources (ex. Google, encyclopedia, "Sage"), and/or sources are not appropriately matched to the target assignment (ex. "Ebsco").	Student does not show evidence of using information sources.
% Students (n=100)	46%	24%	30%	0%
Uses Database Search Features	Student applies multiple appropriate search terms and appropriate Boolean search strategies as well as appropriate use of wildcard/truncation searching; phrase searching; field searching; or other advanced search features.	Student applies multiple appropriate search terms and appropriate Boolean search strategies.	Student applies search terms and simple/basic keyword search strategies and/or uses inappropriate Boolean strategies.	Student does not show evidence of applying search terms.
% Students (n=100)	30%	19%	49%	2%
Applies Evaluative Criteria – Currency	Student states source currency or publication date and accurately assesses the appropriateness in the context of research topic/thesis statement.	Student states source currency or publication date, but inaccurately assesses the appropriateness in the context of research topic/thesis statement.	Student states source currency or publication date, but does not assess the appropriateness in the context of the research topic/thesis statement.	Student does not address source currency or publication date.
% Students (n=100)	10%	5%	40%	45%
Applies Evaluative Criteria – Authority	Student articulates author's credentials accurately, in context of research topic/thesis statement.	Student articulates author's credentials accurately, without context of research topic/thesis statement.	Student provides an inaccurate analysis of author's credentials.	Student does not identify author's credentials.
% Students (n=100)	6%	18%	6%	70%
Applies Evaluative Criteria – Credibility	Student identifies evidence of source credibility accurately, in context of research topic/thesis statement.	Student identifies evidence of source credibility accurately, but without context of research topic/thesis statement.	Student provides inaccurate evidence of source credibility.	Student does not provide evidence of source credibility.
% Students (n=100)	4%	29%	11%	56%
Applies Evaluative Criteria – Relevance	Student describes the relevance of the source with specific examples from the text, in context of research topic/thesis statement.	Student describes the relevance of the source, in context of research topic/thesis statement.	Student states the relevance of the source, but without context of research topic/thesis statement.	Student does not address the relevance of the source; may summarize the source.
% Students (n=100)	32%	29%	14%	25%

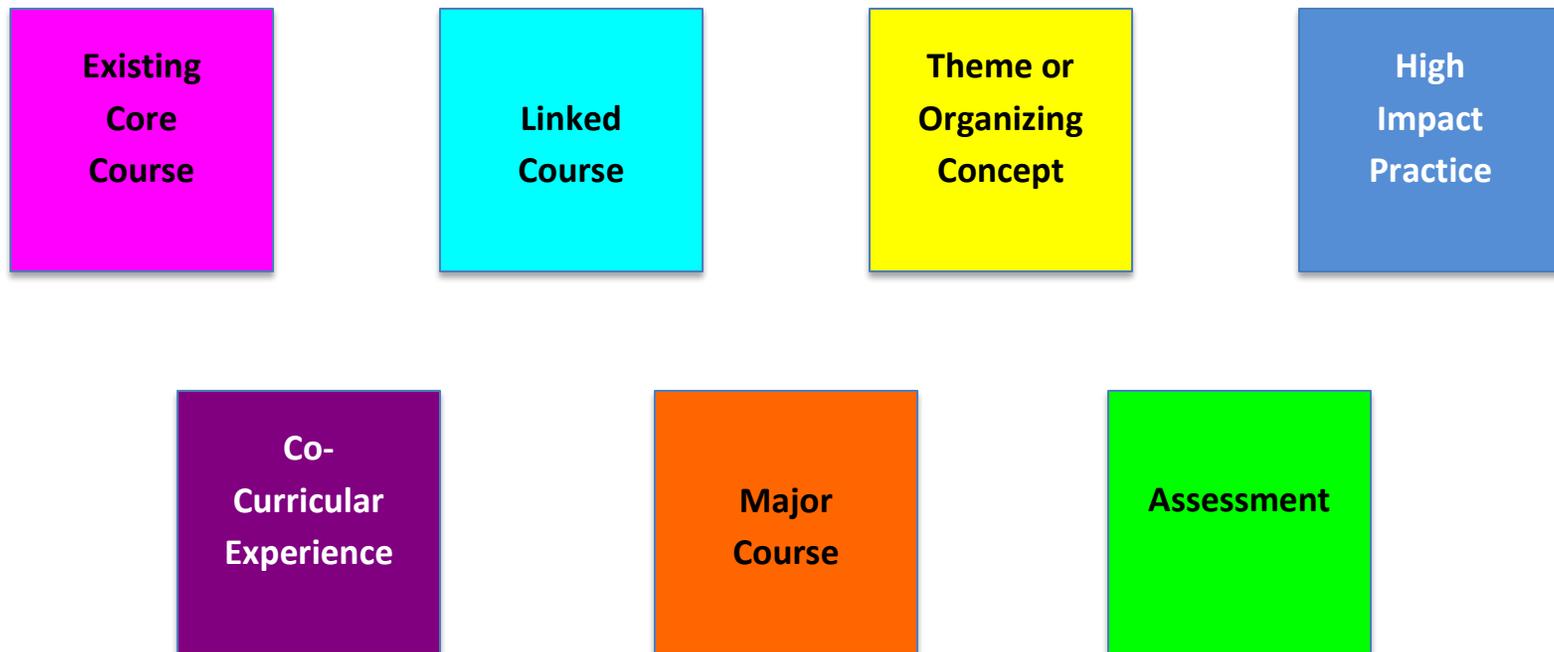
Grey outcomes were items with acceptable levels of interrater reliability based on statistical analysis of librarian and faculty rating decisions.

Activity 3: Constructing a Coherent Pathway

Use the provided materials to construct both a short-term (one year) model and a long-term (5 years) model for integrating information literacy into students' experiences at your institution.

Elements may include: a theme or organizing concept, existing core courses, linked courses, high-impact educational practices, and co-curricular experiences.

Don't forget to indicate how student learning will be assessed!



High-Impact Educational Practices

First-Year Seminars and Experiences

Many schools now build into the curriculum first-year seminars or other programs that bring small groups of students together with faculty or staff on a regular basis. The highest-quality first-year experiences place a strong emphasis on critical inquiry, frequent writing, information literacy, collaborative learning, and other skills that develop students' intellectual and practical competencies. First-year seminars can also involve students with cutting-edge questions in scholarship and with faculty members' own research.

Common Intellectual Experiences

The older idea of a “core” curriculum has evolved into a variety of modern forms, such as a set of required common courses or a vertically organized general education program that includes advanced integrative studies and/or required participation in a learning community (see below). These programs often combine broad themes—e.g., technology and society, global interdependence—with a variety of curricular and cocurricular options for students.

Learning Communities

The key goals for learning communities are to encourage integration of learning across courses and to involve students with “big questions” that matter beyond the classroom. Students take two or more linked courses as a group and work closely with one another and with their professors. Many learning communities explore a common topic and/or common readings through the lenses of different disciplines. Some deliberately link “liberal arts” and “professional courses”; others feature service learning.

Writing-Intensive Courses

These courses emphasize writing at all levels of instruction and across the curriculum, including final-year projects. Students are encouraged to produce and revise various forms of writing for different audiences in different disciplines. The effectiveness of this repeated practice “across the curriculum” has led to parallel efforts in such areas as quantitative reasoning, oral communication, information literacy, and, on some campuses, ethical inquiry.

Collaborative Assignments and Projects

Collaborative learning combines two key goals: learning to work and solve problems in the company of others, and sharpening one's own understanding by listening seriously to the insights of others, especially those with different backgrounds and life experiences. Approaches range from study groups within a course, to team-based assignments and writing, to cooperative projects and research.

Undergraduate Research

Many colleges and universities are now providing research experiences for students in all disciplines. Undergraduate research, however, has been most prominently used in science disciplines. With strong support from the National Science Foundation and the research community, scientists are reshaping their courses to connect key concepts and questions with students' early and active involvement in systematic investigation and research. The goal is to involve students with actively contested questions, empirical observation, cutting-edge technologies, and the sense of excitement that comes from working to answer important questions.

Diversity/Global Learning

Many colleges and universities now emphasize courses and programs that help students explore cultures, life experiences, and worldviews different from their own. These studies—which may address U.S. diversity, world cultures, or both—often explore “difficult differences” such as racial, ethnic, and gender inequality, or continuing struggles around the globe for human rights, freedom, and power. Frequently, intercultural studies are augmented by experiential learning in the community and/or by study abroad.

Service Learning, Community-Based Learning

In these programs, field-based “experiential learning” with community partners is an instructional strategy—and often a required part of the course. The idea is to give students direct experience with issues they are studying in the curriculum and with ongoing efforts to analyze and solve problems in the community. A key element in these programs is the opportunity students have to both *apply* what they are learning in real-world settings and *reflect* in a classroom setting on their service experiences. These programs model the idea that giving something back to the community is an important college outcome, and that working with community partners is good preparation for citizenship, work, and life.

Internships

Internships are another increasingly common form of experiential learning. The idea is to provide students with direct experience in a work setting—usually related to their career interests—and to give them the benefit of supervision and coaching from professionals in the field. If the internship is taken for course credit, students complete a project or paper that is approved by a faculty member.

Capstone Courses and Projects

Whether they're called “senior capstones” or some other name, these culminating experiences require students nearing the end of their college years to create a project of some sort that integrates and applies what they've learned. The project might be a research paper, a performance, a portfolio of “best work,” or an exhibit of artwork. Capstones are offered both in departmental programs and, increasingly, in general education as well.



Table 1
Relationships between Selected High-Impact Activities, Deep Learning, and Self-Reported Gains

	Deep Learning	Gains General	Gains Personal	Gains Practical
First-Year				
Learning Communities	+++	++	++	++
Service Learning	+++	++	+++	++
Senior				
Study Abroad	++	+	++	
Student-Faculty Research	+++	++	++	++
Service Learning	++	+++	+++	++
Senior Culminating Experience	++	++	+++	++

+ p < .001, ++ p < .001 & Unstd B > .10, +++ p < .001 & Unstd B > .30

Table 2
Relationships between Selected High-Impact Activities and Clusters of Effective Educational Practices

	Level of Academic Challenge	Active and Collaborative Learning	Student-Faculty Interaction	Supportive Campus Environment
First-Year				
Learning Communities	++	+++	+++	++
Service Learning	++	+++	+++	++
Senior				
Study Abroad	++	++	++	+
Student-Faculty Research	+++	+++	+++	++
Service Learning	++	+++	+++	++
Senior Culminating Experience	++	++	+++	++

+ p < .001, ++ p < .001 & Unstd B > .10, +++ p < .001 & Unstd B > .30

Source: *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter* by George D. Kuh, (Washington, DC: AAC&U, 2008). For information and more resources and research from LEAP, see www.aacu.org/leap.

Exploration #5: Critical Thinking

Carol Ann Gittens

CRITICAL THINKING AS A CORE POST-SECONDARY COMPETENCY: DEFINITION, MEASUREMENT, AND EVALUATION

Carol Ann Gittens
Santa Clara University

WSCUC "Big 5" Core Competency Workshop
May, 2015

GOALS FOR THE SESSION

- ◉ *Engage and Affirm critical thinking skills and positive critical thinking habits of mind.*
- ◉ *Augment understanding of the definition of critical thinking & how it is manifested across the Curriculum*
- ◉ *Expand repertoire of strategies for promoting and assessing students' critical thinking*

FAILURES OF CRITICAL THINKING CONTRIBUTE TO...

patient deaths * lost revenue * ineffective law enforcement * job loss * gullible voters * garbled communications * imprisonment * combat casualties * upside down mortgages * vehicular homicide * bad decisions * unplanned pregnancies * financial mismanagement * heart disease * family violence * repeated suicide attempts * divorce * drug addiction * academic failure * ... * ... *

WHAT WERE WE THINKING?

Gittens, C.A. 2015

3



Can be sunny...

Failures of Critical Thinking

ALSO, FRIGHTENING!



Gittens, C.A. 2015

4

QUESTION: HOW DO WE BUILD SKILLS AND THE DISCIPLINED INTENTION TO USE THOSE SKILLS?

- Performance Arts
- Management
- Science
- Criminal Justice
- Engineering
- Healthcare
- Teaching
- Military
- Engaged citizenry



Given a problem or challenge, how do we go from “confused, disorganized, uncertain or overwhelmed” to “immediate, focused, disciplined, and successful”?

Gittens, C.A. 2015

5

TABLE QUESTION #1:

- We know our graduates are competent critical thinkers because they (can):



Gittens, C.A. 2015

6

Evidence of
critical thinking
includes...



Gittens, C.A. 2015

7

CRITICAL THINKING SLO EXAMPLES

- ◎ Upon graduation, students should be able to:
 - Clarify points of an argument
 - Extend an argument
 - Distinguish between fact and opinion
 - Analyze elements in a complex issue
 - Think through complex issues with judgment and insight
 - Summarize and synthesize a complex issue

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CHALLENGING A FEW MYTHS...

- CT is what you learn at school...(but it doesn't apply to real life)
- Critical thinking *naturally improves* just from being in college.
- "Nobody knows what "critical thinking" really means."
- "What ever it is, CT cannot be measured."



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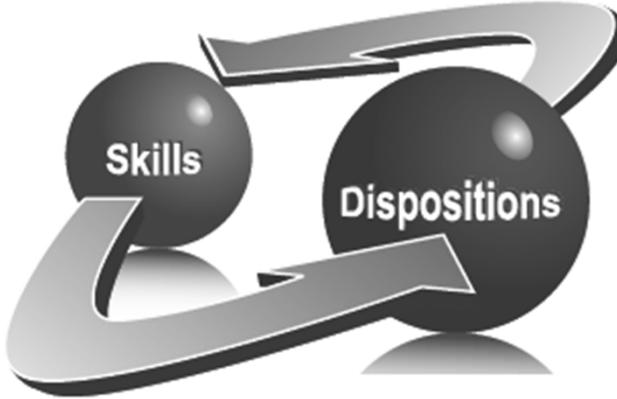
The process of reflective judgment which manifests itself in reasoned considerations of evidence, context, methods, standards, and conceptualizations for the purpose of deciding what to believe or what to do.

CRITICAL THINKING – WORKING CONSENSUS

The Delphi Report: Executive Summary: (1990), The California Academic Press, or ERIC Doc ED315 423

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Skills **Dispositions**

Arts & Humanities
Natural Sciences / STEM
Social Sciences
Professional Disciplines

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Interpretation **Inference**
Self-Regulation
Evaluation **Explanation** **Analysis**

Purposeful reflective judgment

<http://www.insightassessment.com>

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WSCUC CRITICAL THINKING DEFINITION

- ◉ Critical thinking the ability to think in a way that is clear, reasoned, reflective, informed by evidence, and aimed at deciding what to believe or do. Dispositions supporting critical thinking include open-mindedness and motivation to seek the truth.

Reference: <http://www.wascsenior.org/resources/handbook-accreditation-2013/part-iii-wasc-quality-assurance/institutional-report/components-institutional-report/4-educational-quality-student-learning-core-competencies-and-standards-performance>

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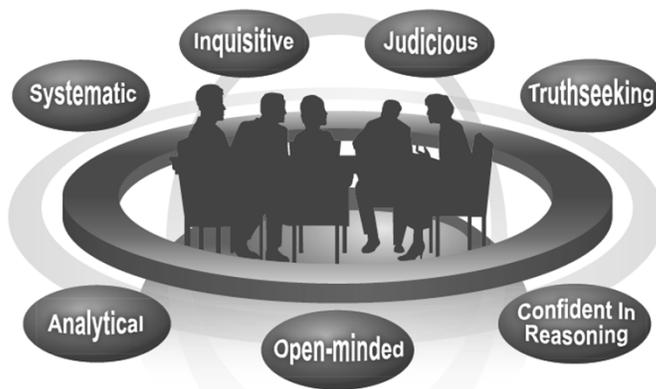
QUESTIONS TO IGNITE CT SKILLS

Skill Area	Potential Prompt
◉ Interpretation	◉ What does this mean? Why is it happening?
◉ Analysis	◉ What are the arguments, pro and con? What assumptions must we make to accept that conclusion?
◉ Inference	◉ Given what we know, what can we conclude? (can we rule out?)
◉ Evaluation	◉ How credible is the claim?
◉ Explanation	◉ Why do you think that? Why is that conclusion correct?
◉ Self-Regulation	◉ How good is the evidence?

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CRITICAL THINKING HABITS OF MIND

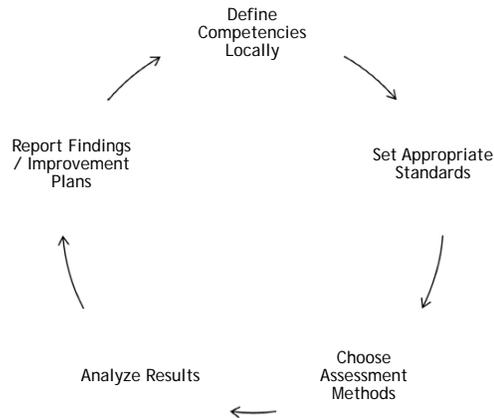


American Philosophical Association Delphi Report:
Consensus Definition of Critical Thinking (1990)
Download : CT Resources Link
www.insightassessment.com
Gittens, C.A., 2010-15

Critical Thinking Habits of Mind



THE ASSESSMENT PROCESS: DETERMINING WHAT EVIDENCE TO COLLECT, AND WHEN TO COLLECT IT



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COGNITIVE SKILLS: VARYING CONCEPTUALIZATIONS

- *Analyzing (judging, evaluating) arguments, claims or evidence*
- *Discourse analysis (critical reading, critical writing)*
- *Making decisions or problem-solving*
- *Inference-making (e.g. induction and deduction)*
- *Predicting (scientific reasoning; hypothesis testing)*
- *Criticism*
- *Reasoning verbally*
- *Interpreting and explaining*
- *Higher order learning*
- *Identifying assumptions*
- *Defining terms*
- *Logical thinking*
- *Asking questions for clarification*
- *Bloom's six-category schema of knowledge, comprehension, application, analysis, synthesis and evaluation*
- *Metacognition*



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TABLE QUESTION #2:

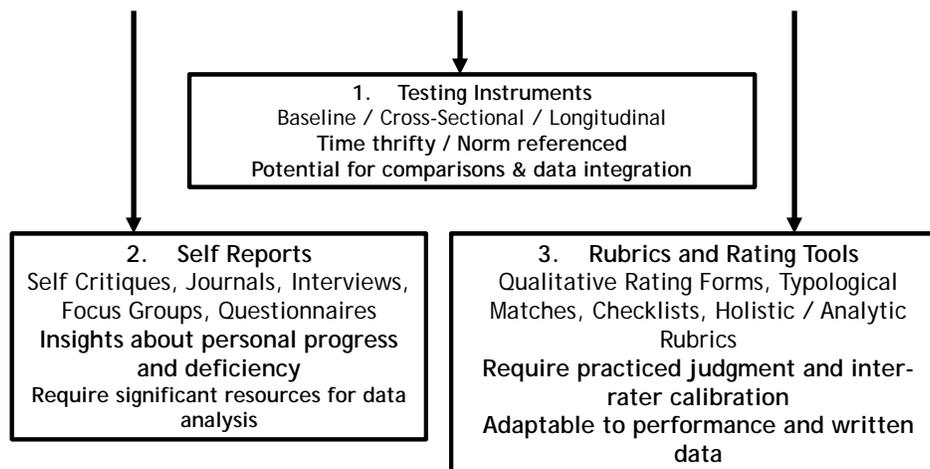
◉Where is CT happening in our curriculum & how do we know?



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THREE BASIC OPTIONS FOR MEASURING LEARNING OUTCOMES



Are we consistently getting a valid and reliable measure of the phenomenon we intended to target?

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TABLE QUESTION #3:

- What assessment strategies to look at CT are already in place?



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SCU CORE CURRICULUM: CRITICAL THINKING & WRITING (CTW 1 & 2)

- 2.1 Read and write with a critical point of view that demonstrates greater depth of thought and a more thorough understanding of the rhetorical situation than in CTW 1.
- 2.2 Write research-based essays that contain well-supported arguable theses and that demonstrate personal engagement and clear purpose.

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Rubric for Evaluating Written Argumentation © 2011 Gittens, C.A. & Measured Reasons LLC, Santa Clara, CA. Reprinted with Permission. www.measuredreasons.com				
	Highly Developed	Developed	Underdeveloped	Substandard
Purpose and Focus	The writer has made insightful and mature decisions about focus, organization, and purpose of the writing.	The writer has made good decisions about focus, organization, and purpose of the writing.	The writer's decisions about focus, organization, and purpose of the writing are weak.	The writer's decisions about focus, organization, and purpose of the writing are poor.
Depth of Thought	The information presented is thoughtful and shows a deep understanding of the issue. The writer is aware of the implications of the information.	The information presented is thoughtful and shows a good understanding of the issue. The writer is aware of the implications of the information.	The information presented is weak and shows a limited understanding of the issue. The writer is not aware of the implications of the information.	The information presented is poor and shows a limited understanding of the issue. The writer is not aware of the implications of the information.
Thesis	Has a highly specific and clear thesis statement that provides direction to the essay. Uses sources to support, extend, and inform, but not substitute for the writer's own development of ideas.	Uses sources to support and inform writer's own development of ideas.	Offers some supporting evidence. The case includes some examples that are too general, not interpreted, or not clearly relevant to thesis.	Offers simplistic, underdeveloped, fallacious, circular, or irrelevant arguments. Includes exaggerations, faulty reasoning, factual errors, biased statements, etc. (See Holistic Critical Thinking Scoring Rubric.)
Reasoning	Substantial and well-reasoned development of ideas. All key assumptions are made explicit. Credible evidence is germane, and accurately analyzed and fairly interpreted. Displays strong critical thinking skills and habits of mind (See Holistic Critical Thinking Scoring Rubric.)	Offers solid reasoning. Most key assumptions are recognized or made explicit. Most inferences are accurate, and most examples are on point.	Offers some supporting evidence. The case includes some examples that are too general, not interpreted, or not clearly relevant to thesis.	Offers simplistic, underdeveloped, fallacious, circular, or irrelevant arguments. Includes exaggerations, faulty reasoning, factual errors, biased statements, etc. (See Holistic Critical Thinking Scoring Rubric.)

Purpose and Focus
Depth of Thought
Thesis
Reasoning



REWA, page 1 of 2
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CALIBRATION ON THE CT RUBRIC

- Analytic rubric
- 4 criteria of CT Skills
- Key features in each level
- Essential step: **NORMING**



APPLYING THE CT RUBRIC



- ◎ Score the sample paper #703 in your binder
- ◎ Work independently (we will discuss)!
- ◎ Mark a cell on each row the CT rubric
- ◎ Calculate overall score (between 4-16)

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ESTABLISHING PERFORMANCE STANDARDS

● Considerations - who are the students?

● Performance Standards:

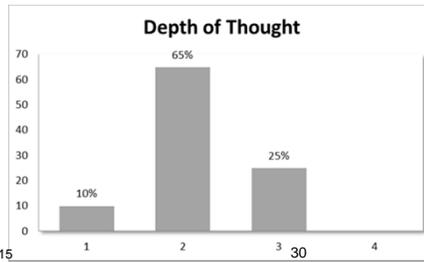
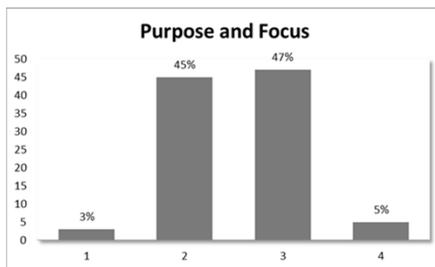
- ❖ 80% Level 2 or higher
- ❖ 50% Level 3 or higher



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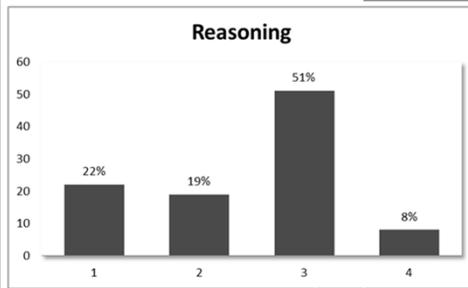
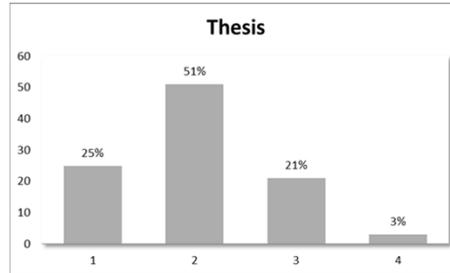
(Hypothetical) RESULTS FOR TWO CT DOMAINS



CT Performance Standards:
80% Level 2 or higher
50% Level 3 or higher

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(Hypothetical) CT RESULTS CONT.

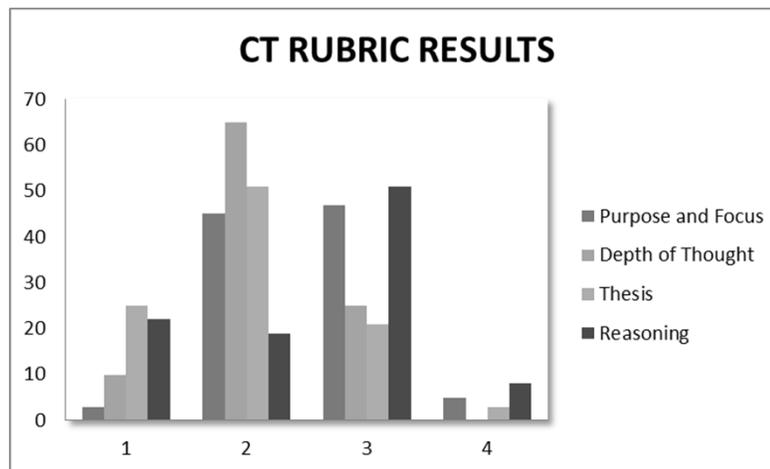


CT Performance Standards:
80% Level 2 or higher
50% Level 3 or higher

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(Hypothetical) SUMMARY OF FINDINGS



CT Performance Standards:
80% Level 2 or higher? YES for Domains1 & 2
50% Level 3 or higher? YES for Domains1 & 4

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WHAT MIGHT EXPLAIN WEAK PERFORMANCE?



1. Students have not mastered the learning outcome(s).
- ➔ 2. Students were not given an opportunity to truly demonstrate their mastery.
3. Performance standards are not appropriate.

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ALIGNMENT, ALIGNMENT, ALIGNMENT!

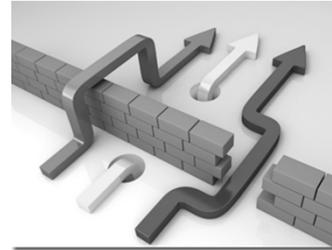


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OBSTACLES TO OVERCOME

- Variability of assignment formats (prompts?)
- Necessary flexibility (ambiguity) in the rubric language
 - Rubrics not developed for a specific assignment
- Scorers' familiarity with course / assignment / texts
- Insufficient training and calibration
- Alignment of assignment with learning objectives
- External Benchmarks



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EXPANDING TO INCLUDE MULTIPLE CORE COMPETENCIES

- Natural combinations: CTIL, CTWC, CTQR, CTOC...
- Opportunity to refine rubrics
- Faculty Developed Performances *across disciplines*
- *Multiple Points in TIME*



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TABLE QUESTION #4:

⦿ I am going to take the following idea(s) back to my campus:

OR

⦿ I plan to talk to _____ about what we talked about in this session.

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QUESTIONS & COMMENTS?



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**THANK
YOU!**

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The “ism’s” of Health: Nutritionism and Vegetarianism

Student #703

3-13-2014

In the struggle between humans and health, there have always been many solutions that claim to have the best way to be fit. Since nutrition science was invented in the 1970's and '80's, people have started to eat foods that differ from those of their ancestors and weight gain has been apparent globally. Scientists have modified our foods and our minds to make us think that we are eating healthy. In actuality, our bodies are being filled with nutrients that are not benefitting us to their full potential. The low-carbohydrate or low-fat meal was fed to us by a way of thinking that has not proven to be useful: nutritionism. People of the past would eat without worrying if they took in too many calories or if their carbohydrate intake was proportional to their meal size, but people today are constantly stressed about their health. Nutritionism overemphasizes proper nutrition leading to unnecessary stress while vegetarianism is a healthy alternative because it leads to a balanced diet and it has greater implications.

Nutritionism came about in the late 20th century when scientists started to dissect foods and think of them as a sum of their nutrients. I believe that this new way of thinking is unhealthy because many foods and meals have more benefits than just what each nutrient gives to the body. Nutrients should not be thought of individually, but this problem is now ingrained in our society. Even the government has endorsed nutritionism in many forms. One example is the FDA policy that, "the nutrition information must be set off in a box" ("Guidance for industry," 2013). This means that each nutrient has to be displayed with the percent of your recommended daily value that it fills. However, it is not right to fully blame the government because a lot of legislation is heavily influenced by lobbyists whose interests may be different than what benefits society as a whole. In any case, the government does support nutritionism and many people will follow what they say. People might think that filling each of these quota will lead to a healthy diet, but I would argue otherwise because recent studies have shown that the amount of carbohydrates that

people currently eat is too high. Gary Taubes discusses in his book that an excess of carbohydrates leads to many of the “Diseases of Civilization” like diabetes, cancer, and cardiovascular disease (Taubes, 2007). The idea that carbohydrates are the enemy and not fat, as was previously assumed, is revolutionary. If people are trying to fill their recommended amount of something that is unhealthy, they are more likely to have the diseases that Taubes talks about. The whole current way of thinking about how to be nourished is awry and I believe that there are reasonable ways to fix a problem that is becoming global.

I believe that one answer to our societal problem of poor health is vegetarianism, or a diet without meat. This diet not only takes away the fat and other problems that can come with meat, but it encourages a larger consumption of plants that can be very healthy. Also, I believe that eating more natural foods, like fruits and vegetables, will steer people away from refined carbohydrates. Carbohydrates are, as I mentioned, part of the reason people are overweight. With less fat and carbohydrates and more plants, I think that people can reverse the trend towards obesity. With the increase of plant life in the diet, many health problems can be lessened or disappear completely. In my research, I have found that more studies show an absence of health detriments rather than increased benefits specific to a vegetarian diet. An article in the American Journal of Clinical Nutrition gives three main examples of what this diet prevents. Those are cardiovascular disease (CVD), cancer, and bone health. This seems to come from the fact that vitamins, fiber, and antioxidants are more prevalent. These nutrients help the body to fight off diseases (Craig, 2009). I gained a good, general idea for what a vegetarian diet does for health, but I was still left curious about the specifics of these topics. The American Cancer Society supports vegetarian diets because they do seem to lower risks of colon and sometimes prostate cancer. However, some of the studies they cite say that it is not actually the diet that makes

vegetarians healthier, but the better health consciousness of being a vegetarian (American Cancer Society, 2010). Health consciousness may be just as effective in lowering cancer rates, but I believe that a no meat diet will provide health benefits beyond cancer. The main way is that CVD rates are much lower. An article in the Annals of Nutrition and Metabolism did a study in which the results said, “that vegetarians have a significantly lower ischemic heart disease mortality” (Huang, 2012). “Ischemic” refers to the kind of clots that lead to strokes. A leading factor of CVD is obesity, which is rising in America. Body mass index (BMI) measures how much fat a person has on their body. A UK cohort study that compared the BMI of meat eaters and vegetarians. Their result was that the vegetarian group had a lower BMI on average (Public Health Nutr., 2004). A difference in CVD rates among vegetarians and meat eaters is important because of the dramatic increase in CVD related illness and death in the US. If a vegetarian diet can help lower this, I think that more people should be moving towards this lifestyle. Lowering the risk of cancers and cardiovascular disease makes vegetarianism the best solution to the problems that nutritionism has created.

Even though vegetarians do not eat meat, enough nutrients are supplied to sustain a healthy body. Since there are so many plants with different qualities, many things that are cut out of this diet have replacements. However, I think that people are worried that vegetarians do not get enough of each vital nutrient. Some deficiencies like protein, calcium, vitamins D and B-12, iron, and zinc can be problematic. However, these are easily avoided by either a taking a supplement or eating the right foods. Also, many soy products are fortified with vitamins and calcium to help lower the chance of deficiencies (Craig, 2009). A lack of protein may be seen as the biggest problem, but the Better Health Channel lists good sources of protein, only one of which is meat. They recommend cereal, eggs, dairy, seeds, nuts, beans, soy, and grains

(Unknown, 2013). With all the different options that are not meat, it seems that it would not be hard to keep protein in a vegetarian diet. Another reason that it may be good to eliminate meat is that it seems to be taking over meals, at least in my personal experience. It is recommended that half of a meal is fruits and vegetables and the rest is to be made up of protein, starches, grains, and dairy. But many of the meals that I buy or make have a large emphasis on protein and some vegetables on the side. This is not what a meal should be made up of and vegetarianism is a reasonable solution to this. Without meat, a plate would be filled up with vegetables and other foods that can have less adverse effects than meat. In my opinion, it is easy to make up for the minor shortcomings of a vegetarian diet.

Another concern about leading a vegetarian lifestyle could be that it is difficult to maintain. Growing up eating meat with meat at least one meal a day, the transition to no meat at all seems intimidating. However, I believe that there are several reasons that are convincing enough for anyone to be vegetarian and stick with it. First is the issue of animal rights. There are millions of Americans that eat several meals a day with meat in them. Thinking about how many cows, pigs, and chickens die each day is almost impossible to fathom. Not to mention how they are raised. Animals are treated poorly from birth, kept in cramped spaces, pumped full of growth hormones and antibiotics, and then slaughtered by machines. The Compassion in World Farming Organization has many videos that show the atrocities animals go through. They present shocking footage that seems to try to scare you into not supporting these companies by not eating meat (Compassion in World Farming, 2007). After watching just one of these videos, I have become more conscious of what some people do to make a profit off of these animals which should have rights, too. Becoming vegetarian for ethical reasons is not just a noble cause, but a better reason for not eating meat. This was shown in a study done that was published in

“Appetite”. The study surveyed a lot a vegetarians as to why they became vegetarian, their current motivation for being vegetarian, and how long they have been. The surveyed were split into three groups: ethical, health, and others. The results were that ethical vegetarians were vegetarians for longer. The average span was 10 years for those who switched for moral reasons and 5.9 years for those who wanted increased health (Hoffman, 2013). So while health is an important factor in vegetarianism, it seems as if there needs to be a different reason behind the switch. To me, it makes sense that someone who believes that they are helping animals would be more motivated to stay a vegetarian than someone who is for health reasons because they may tire of the diet. The only flaw I can see in this study is if, by coincidence, the group surveyed for health vegetarians happened to recently switch. This could be solved with more studies of the sort that ask more vegetarians from a wider range of people. Another type of ethical vegetarian could be someone who tries to lessen the environmental damage that is being done by growing and killing animals. A study in a journal called *Agriculture, Ecosystems, and Environment* looked at vegetarian carbon footprints in India, where many people are vegetarian for religious reasons. Their best result was that, “A non-vegetarian meal with mutton emitted GHG 1.8 times of a vegetarian meal, 1.5 times of a non-vegetarian meal with chicken and an ovo-vegetarian meal and 1.4 times a lacto-vegetarian meal”. People who ate meat had an outstandingly larger carbon emission than those who did not. This is due to the emissions from the farm, transportation, processing, and preparing animal meat. The researchers do believe that, “Change in food habit... could offer a possibility for GHG mitigation” (Pathak, 2010). There are plenty of reasons that vegetarianism could benefit not only the individual, but the world as a whole. In conclusion, a vegetarian diet can be hard to maintain, but with the right motivation it is possible.

Modern society has many things to worry about, ranging from global warfare to individual economies. I think the issue of the health of citizens should not be one of the biggest global problems, but it keeps growing and affecting more countries. Part of this is due to the sheer amount of processed foods that are available for such a low price. I think that another main problem is that people are paying too much attention to what they eat. The emphasis on calorie counting and proportionality of food groups has become excessive. Many people are obsessed with watching what they eat to the point that it is no longer healthy. My answer is vegetarianism. I believe that a vegetarian diet will provide all the proper nutrients and balance our diets. There are huge benefits like the reduced risk of cancer and heart disease and very the drawbacks are avoidable. That being said, it may be hard for some people to switch from their current diet. I suggest looking at the ethics behind vegetarianism because it is statistically proven that people who change for ethical reasons are vegetarians for longer than those who want the health benefits alone. Vegetarianism, to me, is the answer that will solve the global health crisis and it can reduce global warming on a large scale.

References:

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Hoffman, S. (2013). Differences between health and ethical vegetarians. strength of conviction, nutrition knowledge, dietary restriction, and duration of adherence. *65*, 139-144. Retrieved from <http://www.sciencedirect.com.libproxy.scu.edu/science/article/pii/S0195666313000676>

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Pathak, H. H. (2010) Carbon footprints on Indian food items. *Agriculture, Ecosystems, and Environment*, *139*(1/2), 63-73. doi:10.1016/j.agee.2010.07.002

Public Health Nutr. (2004). The uk women's cohort study: comparison of vegetarians, fish-eaters and meat-eaters. *US National Library of Medicine National Institutes of Health*, Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15482612>

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(2013). *Guidance for industry: A food labeling guide*. Retrieved from FDA website:

<http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/labelingnutrition/ucm064894.htm>

CRITICAL THINKING EVALUATION RUBRIC

	1	2	3	4
Purpose and Focus	The writer's decisions about focus, organization, or content interfere with communication. The purpose of the writing is not achieved.	The writer's decisions about focus, organization, or content sometimes interfere with clear, effective communication. The purpose of the writing is not fully achieved.	The writer has made good decisions about focus, organization, and content to communicate clearly and effectively. The purpose and focus of the writing are clear to the reader and the organization and content achieve the purpose as well.	The writer has made insightful and mature decisions about focus, organization, and content to communicate clearly and effectively. The purpose and focus of the writing are clear to the reader and the organization and content are well chosen, sophisticated, and /or persuasive.
Depth of Thought	The information presented reveals the writer's lack of assimilation and understanding of the material. The writer's assertions lack awareness of implications beyond the immediate analysis / study.	The information presented reveals that the writer has only partially assimilated or understood the material. The writer shows some awareness of implications beyond the immediate analysis / study.	The information presented reveals the writer appreciates and understands the material. The writer seems aware of implications beyond the immediate analysis / study.	The information presented reveals the writer's assimilation and understanding of the material. The writer is convincingly aware of implications beyond the immediate analysis /study.
Thesis	Lacks a clear, recognizable assertion and/or lacks adequate sources.	Uses relevant sources but lacks variety of sources and/or the skillful combination of sources necessary to support a central assertion.	Has a clear, recognizable assertion that provides focus and direction to the work. Uses sources to support and inform writer's own development of ideas.	Has a highly developed, defensible assertion that provides focus and direction to the work. Uses sources to support, extend, and inform, but not substitute for the writer's own development of ideas.
Reasoning	Offers simplistic, underdeveloped, fallacious, circular, or irrelevant arguments. Includes exaggerations, faulty reasoning, factual errors, biased statements, etc.	Offers some supporting evidence. The work includes some examples that are too general, not interpreted, or not clearly relevant to thesis.	Offers solid reasoning. Most key assumptions are recognized or made explicit. Most inferences are accurate. Examples are credible and on point, but may not be fully analyzed or interpreted.	Substantial and well-reasoned development of ideas; All key assumptions are made explicit. Credible evidence is germane, accurately analyzed, and fair-mindedly interpreted.

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I believe that one answer to our societal problem of poor health is vegetarianism, or a diet without meat. This diet not only takes away the fat and other problems that can come with meat, but it encourages a larger consumption of plants that can be very healthy. Also, I believe that eating more natural foods, like fruits and vegetables, will steer people away from refined carbohydrates. Carbohydrates are, as I mentioned, part of the reason people are overweight. With less fat and carbohydrates and more plants, I think that people can reverse the trend towards obesity. With the increase of plant life in the diet, many health problems can be lessened or disappear completely. In my research, I have found that more studies show an absence of health detriments rather than increased benefits specific to a vegetarian diet. An article in the American Journal of Clinical Nutrition gives three main examples of what this diet prevents. Those are cardiovascular disease (CVD), cancer, and bone health. This seems to come from the fact that vitamins, fiber, and antioxidants are more prevalent. These nutrients help the body to fight off diseases (Craig, 2009). I gained a good, general idea for what a vegetarian diet does for health, but I was still left curious about the specifics of these topics. The American Cancer Society supports vegetarian diets because they do seem to lower risks of colon and sometimes prostate cancer. However, some of the studies they cite say that it is not actually the diet that makes

vegetarians healthier, but the better health consciousness of being a vegetarian (American Cancer Society, 2010). Health consciousness may be just as effective in lowering cancer rates, but I believe that a no meat diet will provide health benefits beyond cancer. The main way is that CVD rates are much lower. An article in the *Annals of Nutrition and Metabolism* did a study in which the results said, “that vegetarians have a significantly lower ischemic heart disease mortality” (Huang, 2012). “Ischemic” refers to the kind of clots that lead to strokes. A leading factor of CVD is obesity, which is rising in America. Body mass index (BMI) measures how much fat a person has on their body. A UK cohort study that compared the BMI of meat eaters and vegetarians. Their result was that the vegetarian group had a lower BMI on average (Public Health Nutr., 2004). A difference in CVD rates among vegetarians and meat eaters is important because of the dramatic increase in CVD related illness and death in the US. If a vegetarian diet can help lower this, I think that more people should be moving towards this lifestyle. Lowering the risk of cancers and cardiovascular disease makes vegetarianism the best solution to the problems that nutritionism has created.

Even though vegetarians do not eat meat, enough nutrients are supplied to sustain a healthy body. Since there are so many plants with different qualities, many things that are cut out of this diet have replacements. However, I think that people are worried that vegetarians do not get enough of each vital nutrient. Some deficiencies like protein, calcium, vitamins D and B-12, iron, and zinc can be problematic. However, these are easily avoided by either a taking a supplement or eating the right foods. Also, many soy products are fortified with vitamins and calcium to help lower the chance of deficiencies (Craig, 2009). A lack of protein may be seen as the biggest problem, but the Better Health Channel lists good sources of protein, only one of which is meat. They recommend cereal, eggs, dairy, seeds, nuts, beans, soy, and grains

(Unknown, 2013). With all the different options that are not meat, it seems that it would not be hard to keep protein in a vegetarian diet. Another reason that it may be good to eliminate meat is that it seems to be taking over meals, at least in my personal experience. It is recommended that half of a meal is fruits and vegetables and the rest is to be made up of protein, starches, grains, and dairy. But many of the meals that I buy or make have a large emphasis on protein and some vegetables on the side. This is not what a meal should be made up of and vegetarianism is a reasonable solution to this. Without meat, a plate would be filled up with vegetables and other foods that can have less adverse effects than meat. In my opinion, it is easy to make up for the minor shortcomings of a vegetarian diet.

Another concern about leading a vegetarian lifestyle could be that it is difficult to maintain. Growing up eating meat with meat at least one meal a day, the transition to no meat at all seems intimidating. However, I believe that there are several reasons that are convincing enough for anyone to be vegetarian and stick with it. First is the issue of animal rights. There are millions of Americans that eat several meals a day with meat in them. Thinking about how many cows, pigs, and chickens die each day is almost impossible to fathom. Not to mention how they are raised. Animals are treated poorly from birth, kept in cramped spaces, pumped full of growth hormones and antibiotics, and then slaughtered by machines. The Compassion in World Farming Organization has many videos that show the atrocities animals go through. They present shocking footage that seems to try to scare you into not supporting these companies by not eating meat (Compassion in World Farming, 2007). After watching just one of these videos, I have become more conscious of what some people do to make a profit off of these animals which should have rights, too. Becoming vegetarian for ethical reasons is not just a noble cause, but a better reason for not eating meat. This was shown in a study done that was published in

“Appetite”. The study surveyed a lot a vegetarians as to why they became vegetarian, their current motivation for being vegetarian, and how long they have been. The surveyed were split into three groups: ethical, health, and others. The results were that ethical vegetarians were vegetarians for longer. The average span was 10 years for those who switched for moral reasons and 5.9 years for those who wanted increased health (Hoffman, 2013). So while health is an important factor in vegetarianism, it seems as if there needs to be a different reason behind the switch. To me, it makes sense that someone who believes that they are helping animals would be more motivated to stay a vegetarian than someone who is for health reasons because they may tire of the diet. The only flaw I can see in this study is if, by coincidence, the group surveyed for health vegetarians happened to recently switch. This could be solved with more studies of the sort that ask more vegetarians from a wider range of people. Another type of ethical vegetarian could be someone who tries to lessen the environmental damage that is being done by growing and killing animals. A study in a journal called *Agriculture, Ecosystems, and Environment* looked at vegetarian carbon footprints in India, where many people are vegetarian for religious reasons. Their best result was that, “A non-vegetarian meal with mutton emitted GHG 1.8 times of a vegetarian meal, 1.5 times of a non-vegetarian meal with chicken and an ovo-vegetarian meal and 1.4 times a lacto-vegetarian meal”. People who ate meat had an outstandingly larger carbon emission than those who did not. This is due to the emissions from the farm, transportation, processing, and preparing animal meat. The researchers do believe that, “Change in food habit... could offer a possibility for GHG mitigation” (Pathak, 2010). There are plenty of reasons that vegetarianism could benefit not only the individual, but the world as a whole. In conclusion, a vegetarian diet can be hard to maintain, but with the right motivation it is possible.

Modern society has many things to worry about, ranging from global warfare to individual economies. I think the issue of the health of citizens should not be one of the biggest global problems, but it keeps growing and affecting more countries. Part of this is due to the sheer amount of processed foods that are available for such a low price. I think that another main problem is that people are paying too much attention to what they eat. The emphasis on calorie counting and proportionality of food groups has become excessive. Many people are obsessed with watching what they eat to the point that it is no longer healthy. My answer is vegetarianism. I believe that a vegetarian diet will provide all the proper nutrients and balance our diets. There are huge benefits like the reduced risk of cancer and heart disease and very the drawbacks are avoidable. That being said, it may be hard for some people to switch from their current diet. I suggest looking at the ethics behind vegetarianism because it is statistically proven that people who change for ethical reasons are vegetarians for longer than those who want the health benefits alone. Vegetarianism, to me, is the answer that will solve the global health crisis and it can reduce global warming on a large scale.

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CRITICAL THINKING EVALUATION RUBRIC

	1	2	3	4
Purpose and Focus	The writer's decisions about focus, organization, or content interfere with communication. The purpose of the writing is not achieved.	The writer's decisions about focus, organization, or content sometimes interfere with clear, effective communication. The purpose of the writing is not fully achieved.	The writer has made good decisions about focus, organization, and content to communicate clearly and effectively. The purpose and focus of the writing are clear to the reader and the organization and content achieve the purpose as well.	The writer has made insightful and mature decisions about focus, organization, and content to communicate clearly and effectively. The purpose and focus of the writing are clear to the reader and the organization and content are well chosen, sophisticated, and /or persuasive.
Depth of Thought	The information presented reveals the writer's lack of assimilation and understanding of the material. The writer's assertions lack awareness of implications beyond the immediate analysis / study.	The information presented reveals that the writer has only partially assimilated or understood the material. The writer shows some awareness of implications beyond the immediate analysis / study.	The information presented reveals the writer appreciates and understands the material. The writer seems aware of implications beyond the immediate analysis / study.	The information presented reveals the writer's assimilation and understanding of the material. The writer is convincingly aware of implications beyond the immediate analysis /study.
Thesis	Lacks a clear, recognizable assertion and/or lacks adequate sources.	Uses relevant sources but lacks variety of sources and/or the skillful combination of sources necessary to support a central assertion.	Has a clear, recognizable assertion that provides focus and direction to the work. Uses sources to support and inform writer's own development of ideas.	Has a highly developed, defensible assertion that provides focus and direction to the work. Uses sources to support, extend, and inform, but not substitute for the writer's own development of ideas.
Reasoning	Offers simplistic, underdeveloped, fallacious, circular, or irrelevant arguments. Includes exaggerations, faulty reasoning, factual errors, biased statements, etc.	Offers some supporting evidence. The work includes some examples that are too general, not interpreted, or not clearly relevant to thesis.	Offers solid reasoning. Most key assumptions are recognized or made explicit. Most inferences are accurate. Examples are credible and on point, but may not be fully analyzed or interpreted.	Substantial and well-reasoned development of ideas; All key assumptions are made explicit. Credible evidence is germane, accurately analyzed, and fair-mindedly interpreted.

RESOURCES

WSCUC



WASCUC 2013 Handbook of Accreditation's Glossary Definitions of Core Competencies

Written communication

communication by means of written language for informational, persuasive, and expressive purposes. Written communication may appear in many forms, or genres. Successful written communication depends on mastery of the conventions of the written language, facility with culturally accepted structures for presentation and argument, awareness of audience, and other situation-specific factors.

Quantitative reasoning

the ability to apply mathematical concepts to the interpretation and analysis of quantitative information in order to solve a wide range of problems, from those arising in pure and applied research to everyday issues and questions. It may include such dimensions as ability to apply math skills, judge reasonableness, communicate quantitative information, and recognize the limits of mathematical or statistical methods.

Oral communication

communication by means of spoken language for informational, persuasive, and expressive purposes. In addition to speech, oral communication may employ visual aids, body language, intonation, and other non-verbal elements to support the conveyance of meaning and connection with the audience. Oral communication may include speeches, presentations, discussions, dialogue, and other forms of interpersonal communication, either delivered face to face or mediated technologically.

Information literacy

according to the Association of College and Research Libraries, the ability to “recognize when information is needed and have the ability to locate, evaluate, and use the needed information” for a wide range of purposes. An information-literate individual is able to determine the extent of information needed, access it, evaluate it and its sources, use the information effectively, and do so ethically and legally.

Critical thinking

the ability to think in a way that is clear, reasoned, reflective, informed by evidence, and aimed at deciding what to believe or do. Dispositions supporting critical thinking include open-mindedness and motivation to seek the truth.



Core Competency FAQs

Overview & Purpose

In the *2013 Handbook of Accreditation*, Criteria for Review 2.2a states:

Baccalaureate programs engage students in an integrated course of study of sufficient breadth and depth to prepare them for work, citizenship, and life-long learning. These programs ensure the development of core competencies including, but not limited to, **written and oral communication, quantitative reasoning, information literacy, and critical thinking.**

Component 4 (Educational Quality) of the Institutional Review Process asks for institutions “to describe how the curriculum addresses each of the five core competencies, explain their learning outcomes in relation to those core competencies, and demonstrate, through evidence of student performance, the extent to which those outcomes are achieved.”

The purpose of these FAQs is to provide additional information to institutions regarding the five core competencies.

1. How did WSCUC come up with these five competencies? Why were writing (W), oral communication (OC), quantitative reasoning (QR), information literacy (IL), and critical thinking (CT) singled out for such focused treatment in the institutional report?

These competencies have been part of Standard 2 for undergraduate degrees (criterion for review 2.2a) since 2001. The language of CFR 2.2 states that “all degrees . . . awarded by the institution are clearly defined in terms of . . . levels of student achievement necessary for graduation that represent more than simply an accumulation of courses or credits.” Now, at a time when there is widespread concern about the quality of graduates’ learning, and when assessment practices have emerged that are able to address these outcomes in nuanced ways, the Commission is asking for documentation of actual achievement.

While CFR 2.2a mentions additional outcomes beyond the five core competencies – e.g., creativity, appreciation for diversity, and civic engagement – the five that are the focus of component 4 were deemed generic, fundamental to students’ future success, and assessable. The focus on these five does not in any way limit institutions that wish to address additional competencies.

2. What are the definitions of these five core competencies? Who gets to define them?

Institutions are free to define each core competency in a way that makes sense for the institution, its mission, its values, and the needs of its student body. The assumption, however, is that these are generic competencies – that is, applicable across multiple programs – that will be approached in an interdisciplinary, integrative way. Institutions have a lot of latitude in deciding how they will do that.

3. Are these core competencies supposed to be institutional learning outcomes (ILOs)?

That's one way to approach them. For many institutions, there's a lot of overlap between their ILOs and the five core competencies. For very large, complex institutions, it may be more appropriate – and manageable – to approach them at the college, division, or department level.

4. Can institutions assess the core competencies in the major?

Because most students take major courses right to the end of their studies, there are advantages in embedding core competencies into the assessment of the major or professional field. Many majors use capstones, senior projects, e-portfolios, or other methods of collecting student work for assessment, and these can provide evidence of students' mastery of the competencies. Assessing core competencies at the degree level allows expectations and types of evidence to be adapted to the degree. For example, depending on the field, oral communication skills might be demonstrated through debating, interviewing, negotiating, counseling, or presenting ideas.

In some cases, assessing students' level of achievement in a particular competency through the major assessment might not seem appropriate (e.g., quantitative reasoning in an English or dance major) or feasible, where faculty are reluctant to integrate them into their assessment of the major. In that case, the institution can look at other options such as upper-division GE; signature assignments across a range of upper-division courses that students may be taking as electives; or a core competency portfolio that students assemble with artifacts that illustrate each of the core competencies. The benefit of this last approach is that it can also include items from the co-curriculum or internships.

So the answer to the question about "having" to assess core competencies in the major is no. The major is probably the easiest place to do it, but not the only place, and it's definitely not required.

5. Do institutions need to assess and support transfer students' development of the CCs?

Yes. The diploma that students receive, whether they're native students or transfers, will look the same. It's the institution's responsibility – as well as in the student's interest – to ensure that the degree represents high-quality learning for every graduate.

6. Academic programs are all so different. Does this mean there are different definitions of the core competencies and different assessment processes for each program?

Program-level learning and assessment results are very important; they're a key part of program review, which also has a place in the 2013 institutional review process, or IRP (see Component #6: Quality Assurance and Improvement). But with the core competencies, the goal is a higher level of aggregation: the institution level, or at very large and complex universities, the school or college or division level. Institutions should develop processes that allow for differences while at the same time focusing on commonalities across disciplines.

7. Is it necessary to document how much students learned and developed from entry to exit? Should there be pre- and post-testing?

No. While it can be useful to know the trajectory of students' learning over time, so faculty can see where they improved or plateaued or even became less proficient, the focus is on their level of

proficiency at graduation. Think of assessment that measures growth as a tool for enhancing the final result. Pre- and post-testing is one approach to assessment, and it may be useful. But it can also be costly, it is methodologically challenging, and the results can be difficult to interpret. In some contexts, it can be inauthentic and self-serving.

8. What about institutions that award A.A. or A.S. degrees? Should core competencies be assessed for students as they leave with an associate's degree? What if they transfer to a baccalaureate program?

Yes, the Commission cares about students' mastery of competencies in all degree programs, from associate to graduate levels. Institutions that award A.A. or A.S. degrees should also set standards, report results, and document plans for improvement when necessary at those levels.

9. Does this core competency requirement mean that institutions have to show 100% of students meeting the standard? Or that a student who doesn't meet the standard gets a failing grade – for example on their capstone – or doesn't graduate?

No. What is important—to the institution as well as the Commission—is the distribution: what proportion of your students is meeting the standard or even exceeding it? What proportion is below the standard, and how far below? And what do you plan to do to raise overall performance and shift the distribution upward, if you are dissatisfied with the results?

10. How can such extensive and complex findings be documented for the institutional review process, particularly at large institutions with hundreds of programs, multiple divisions, and several degree levels?

As an element of their institutional reports, institutions are asked to describe and provide evidence of how they assess students' achievement of core competencies. Institutions are free to decide how best to organize the setting of proficiency standards, assessment, documentation, and reporting of results, but it must be clear that this work is documented as it occurs throughout the institution. For large, complex institutions a narrative summary might be provided to include where responsibility for this work lies; general information on the definition of these proficiencies and how they were developed; general information on cycles and timelines for reviews across the institution; systems or processes for reviewing data/information obtained through reviews; and locus of authority for taking action based on results. A matrix providing specifics could be created to demonstrate the pervasiveness and effectiveness of this work throughout the institution. Depending on the size and structure of the institution, this might be done through a selection of examples that represent all of the institution's programs, divisions, and degree levels.

Adopted by the Commission in June 2014

RESOURCES

AAC&U

***VALUE* Rubrics**

ORAL COMMUNICATION VALUE RUBRIC

for more information, please contact value@aacu.org



The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

The type of oral communication most likely to be included in a collection of student work is an oral presentation and therefore is the focus for the application of this rubric.

Definition

Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.

Framing Language

Oral communication takes many forms. This rubric is specifically designed to evaluate oral presentations of a single speaker at a time and is best applied to live or video-recorded presentations. For panel presentations or group presentations, it is recommended that each speaker be evaluated separately. This rubric best applies to presentations of sufficient length such that a central message is conveyed, supported by one or more forms of supporting materials and includes a purposeful organization. An oral answer to a single question not designed to be structured into a presentation does not readily apply to this rubric.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Central message:** The main point/thesis/"bottom line"/"take-away" of a presentation. A clear central message is easy to identify; a compelling central message is also vivid and memorable.
- **Delivery techniques:** Posture, gestures, eye contact, and use of the voice. Delivery techniques enhance the effectiveness of the presentation when the speaker stands and moves with authority, looks more often at the audience than at his/her speaking materials/notes, uses the voice expressively, and uses few vocal fillers ("um," "uh," "like," "you know," etc.).
- **Language:** Vocabulary, terminology, and sentence structure. Language that supports the effectiveness of a presentation is appropriate to the topic and audience, grammatical, clear, and free from bias. Language that enhances the effectiveness of a presentation is also vivid, imaginative, and expressive.
- **Organization:** The grouping and sequencing of ideas and supporting material in a presentation. An organizational pattern that supports the effectiveness of a presentation typically includes an introduction, one or more identifiable sections in the body of the speech, and a conclusion. An organizational pattern that enhances the effectiveness of the presentation reflects a purposeful choice among possible alternatives, such as a chronological pattern, a problem-solution pattern, an analysis-of-parts pattern, etc., that makes the content of the presentation easier to follow and more likely to accomplish its purpose.
- **Supporting material:** Explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities, and other kinds of information or analysis that supports the principal ideas of the presentation. Supporting material is generally credible when it is relevant and derived from reliable and appropriate sources. Supporting material is highly credible when it is also vivid and varied across the types listed above (e.g., a mix of examples, statistics, and references to authorities). Supporting material may also serve the purpose of establishing the speaker's credibility. For example, in presenting a creative work such as a dramatic reading of Shakespeare, supporting evidence may not advance the ideas of Shakespeare, but rather serve to establish the speaker as a credible Shakespearean actor.

ORAL COMMUNICATION VALUE RUBRIC

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Definition

Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.

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

	Capstone 4	Milestones		Benchmark 1
		3	2	
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced, but is not explicitly stated in the presentation.

WRITTEN COMMUNICATION VALUE RUBRIC

for more information, please contact value@aacu.org



The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

Framing Language

This writing rubric is designed for use in a wide variety of educational institutions. The most clear finding to emerge from decades of research on writing assessment is that the best writing assessments are locally determined and sensitive to local context and mission. Users of this rubric should, in the end, consider making adaptations and additions that clearly link the language of the rubric to individual campus contexts.

This rubric focuses assessment on how specific written work samples or collections of work respond to specific contexts. The central question guiding the rubric is "How well does writing respond to the needs of audience(s) for the work?" In focusing on this question the rubric does not attend to other aspects of writing that are equally important: issues of writing process, writing strategies, writers' fluency with different modes of textual production or publication, or writer's growing engagement with writing and disciplinarity through the process of writing.

Evaluators using this rubric must have information about the assignments or purposes for writing guiding writers' work. Also recommended is including reflective work samples of collections of work that address such questions as: What decisions did the writer make about audience, purpose, and genre as s/he compiled the work in the portfolio? How are those choices evident in the writing -- in the content, organization and structure, reasoning, evidence, mechanical and surface conventions, and citational systems used in the writing? This will enable evaluators to have a clear sense of how writers understand the assignments and take it into consideration as they evaluate.

The first section of this rubric addresses the context and purpose for writing. A work sample or collections of work can convey the context and purpose for the writing tasks it showcases by including the writing assignments associated with work samples. But writers may also convey the context and purpose for their writing within the texts. It is important for faculty and institutions to include directions for students about how they should represent their writing contexts and purposes.

Faculty interested in the research on writing assessment that has guided our work here can consult the National Council of Teachers of English/ Council of Writing Program Administrators' White Paper on Writing Assessment (2008; www.wpacouncil.org/whitepaper) and the Conference on College Composition and Communication's Writing Assessment: A Position Statement (2008; www.ncte.org/cccc/resources/positions/123784.htm)

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Content Development:** The ways in which the text explores and represents its topic in relation to its audience and purpose.
- **Context of and purpose for writing:** The context of writing is the situation surrounding a text: who is reading it? who is writing it? Under what circumstances will the text be shared or circulated? What social or political factors might affect how the text is composed or interpreted? The purpose for writing is the writer's intended effect on an audience. Writers might want to persuade or inform; they might want to report or summarize information; they might want to work through complexity or confusion; they might want to argue with other writers, or connect with other writers; they might want to convey urgency or amuse; they might write for themselves or for an assignment or to remember.
- **Disciplinary conventions:** Formal and informal rules that constitute what is seen generally as appropriate within different academic fields, e.g. introductory strategies, use of passive voice or first person point of view, expectations for thesis or hypothesis, expectations for kinds of evidence and support that are appropriate to the task at hand, use of primary and secondary sources to provide evidence and support arguments and to document critical perspectives on the topic. Writers will incorporate sources according to disciplinary and genre conventions, according to the writer's purpose for the text. Through increasingly sophisticated use of sources, writers develop an ability to differentiate between their own ideas and the ideas of others, credit and build upon work already accomplished in the field or issue they are addressing, and provide meaningful examples to readers.
- **Evidence:** Source material that is used to extend, in purposeful ways, writers' ideas in a text.
- **Genre conventions:** Formal and informal rules for particular kinds of texts and/or media that guide formatting, organization, and stylistic choices, e.g. lab reports, academic papers, poetry, webpages, or personal essays.
- **Sources:** Texts (written, oral, behavioral, visual, or other) that writers draw on as they work for a variety of purposes -- to extend, argue with, develop, define, or shape their ideas, for example.

WRITTEN COMMUNICATION VALUE RUBRIC

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Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

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

	Capstone 4	Milestones 3	Milestones 2	Benchmark 1
Context of and Purpose for Writing <i>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</i>	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
Content Development	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.	Uses appropriate and relevant content to develop and explore ideas through most of the work.	Uses appropriate and relevant content to develop simple ideas in some parts of the work.
Genre and Disciplinary Conventions <i>Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</i>	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices	Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation	Attempts to use a consistent system for basic organization and presentation.
Sources and Evidence	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.	Demonstrates an attempt to use sources to support ideas in the writing.
Control of Syntax and Mechanics	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.

QUANTITATIVE LITERACY VALUE RUBRIC

for more information, please contact value@aacu.org



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Definition

Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a "habit of mind," competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

Quantitative Literacy Across the Disciplines

Current trends in general education reform demonstrate that faculty are recognizing the steadily growing importance of Quantitative Literacy (QL) in an increasingly quantitative and data-dense world. AAC&U's recent survey showed that concerns about QL skills are shared by employers, who recognize that many of today's students will need a wide range of high level quantitative skills to complete their work responsibilities. Virtually all of today's students, regardless of career choice, will need basic QL skills such as the ability to draw information from charts, graphs, and geometric figures, and the ability to accurately complete straightforward estimations and calculations.

Preliminary efforts to find student work products which demonstrate QL skills proved a challenge in this rubric creation process. It's possible to find pages of mathematical problems, but what those problem sets don't demonstrate is whether the student was able to think about and understand the meaning of her work. It's possible to find research papers that include quantitative information, but those papers often don't provide evidence that allows the evaluator to see how much of the thinking was done by the original source (often carefully cited in the paper) and how much was done by the student herself, or whether conclusions drawn from analysis of the source material are even accurate.

Given widespread agreement about the importance of QL, it becomes incumbent on faculty to develop new kinds of assignments which give students substantive, contextualized experience in using such skills as analyzing quantitative information, representing quantitative information in appropriate forms, completing calculations to answer meaningful questions, making judgments based on quantitative data and communicating the results of that work for various purposes and audiences. As students gain experience with those skills, faculty must develop assignments that require students to create work products which reveal their thought processes and demonstrate the range of their QL skills.

This rubric provides for faculty a definition for QL and a rubric describing four levels of QL achievement which might be observed in work products within work samples or collections of work. Members of AAC&U's rubric development team for QL hope that these materials will aid in the assessment of QL – but, equally important, we hope that they will help institutions and individuals in the effort to more thoroughly embed QL across the curriculum of colleges and universities.

Framing Language

This rubric has been designed for the evaluation of work that addresses quantitative literacy (QL) in a substantive way. QL is not just computation, not just the citing of someone else's data. QL is a habit of mind, a way of thinking about the world that relies on data and on the mathematical analysis of data to make connections and draw conclusions. Teaching QL requires us to design assignments that address authentic, data-based problems. Such assignments may call for the traditional written paper, but we can imagine other alternatives: a video of a PowerPoint presentation, perhaps, or a well designed series of web pages. In any case, a successful demonstration of QL will place the mathematical work in the context of a full and robust discussion of the underlying issues addressed by the assignment.

Finally, QL skills can be applied to a wide array of problems of varying difficulty, confounding the use of this rubric. For example, the same student might demonstrate high levels of QL achievement when working on a simplistic problem and low levels of QL achievement when working on a very complex problem. Thus, to accurately assess a student's QL achievement it may be necessary to measure QL achievement within the context of problem complexity, much as is done in diving competitions where two scores are given, one for the difficulty of the dive, and the other for the skill in accomplishing the dive. In this context, that would mean giving one score for the complexity of the problem and another score for the QL achievement in solving the problem.

INFORMATION LITERACY VALUE RUBRIC

for more information, please contact value@aacu.org



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Definition

The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand. -
Adopted from the National Forum on Information Literacy

Framing Language

This rubric is recommended for use evaluating a collection of work, rather than a single work sample in order to fully gauge students' information skills. Ideally, a collection of work would contain a wide variety of different types of work and might include: research papers, editorials, speeches, grant proposals, marketing or business plans, PowerPoint presentations, posters, literature reviews, position papers, and argument critiques to name a few. In addition, a description of the assignments with the instructions that initiated the student work would be vital in providing the complete context for the work. Although a student's final work must stand on its own, evidence of a student's research and information gathering processes, such as a research journal/diary, could provide further demonstration of a student's information proficiency and for some criteria on this rubric would be required.

CRITICAL THINKING VALUE RUBRIC

for more information, please contact value@aacu.org



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Definition

Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

Framing Language

This rubric is designed to be transdisciplinary, reflecting the recognition that success in all disciplines requires habits of inquiry and analysis that share common attributes. Further, research suggests that successful critical thinkers from all disciplines increasingly need to be able to apply those habits in various and changing situations encountered in all walks of life.

This rubric is designed for use with many different types of assignments and the suggestions here are not an exhaustive list of possibilities. Critical thinking can be demonstrated in assignments that require students to complete analyses of text, data, or issues. Assignments that cut across presentation mode might be especially useful in some fields. If insight into the process components of critical thinking (e.g., how information sources were evaluated regardless of whether they were included in the product) is important, assignments focused on student reflection might be especially illuminating.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- Ambiguity: Information that may be interpreted in more than one way.
- Assumptions: Ideas, conditions, or beliefs (often implicit or unstated) that are "taken for granted or accepted as true without proof." (quoted from www.dictionary.reference.com/browse/assumptions)
- Context: The historical, ethical, political, cultural, environmental, or circumstantial settings or conditions that influence and complicate the consideration of any issues, ideas, artifacts, and events.
- Literal meaning: Interpretation of information exactly as stated. For example, "she was green with envy" would be interpreted to mean that her skin was green.
- Metaphor: Information that is (intended to be) interpreted in a non-literal way. For example, "she was green with envy" is intended to convey an intensity of emotion, not a skin color.

CREATIVE THINKING VALUE RUBRIC

for more information, please contact value@aacu.org



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Definition

Creative thinking is both the capacity to combine or synthesize existing ideas, images, or expertise in original ways and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking.

Framing Language

Creative thinking, as it is fostered within higher education, must be distinguished from less focused types of creativity such as, for example, the creativity exhibited by a small child's drawing, which stems not from an understanding of connections, but from an ignorance of boundaries. Creative thinking in higher education can only be expressed productively within a particular domain. The student must have a strong foundation in the strategies and skills of the domain in order to make connections and synthesize. While demonstrating solid knowledge of the domain's parameters, the creative thinker, at the highest levels of performance, pushes beyond those boundaries in new, unique, or atypical recombinations, uncovering or critically perceiving new syntheses and using or recognizing creative risk-taking to achieve a solution.

The Creative Thinking VALUE Rubric is intended to help faculty assess creative thinking in a broad range of transdisciplinary or interdisciplinary work samples or collections of work. The rubric is made up of a set of attributes that are common to creative thinking across disciplines. Examples of work samples or collections of work that could be assessed for creative thinking may include research papers, lab reports, musical compositions, a mathematical equation that solves a problem, a prototype design, a reflective piece about the final product of an assignment, or other academic works. The work samples or collections of work may be completed by an individual student or a group of students.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- Exemplar: A model or pattern to be copied or imitated (quoted from www.dictionary.reference.com/browse/exemplar).
- Domain: Field of study or activity and a sphere of knowledge and influence.

CREATIVE THINKING VALUE RUBRIC

for more information, please contact value@aacu.org



Definition

Creative thinking is both the capacity to combine or synthesize existing ideas, images, or expertise in original ways and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking

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

	Capstone	Milestones		Benchmark
	4	3	2	1
Acquiring Competencies <i>This step refers to acquiring strategies and skills within a particular domain.</i>	Reflect: Evaluates creative process and product using domain-appropriate criteria.	Create: Creates an entirely new object, solution or idea that is appropriate to the domain.	Adapt: Successfully adapts an appropriate exemplar to his/her own specifications.	Model: Successfully reproduces an appropriate exemplar.
Taking Risks <i>May include personal risk (fear of embarrassment or rejection) or risk of failure in successfully completing assignment, i.e. going beyond original parameters of assignment, introducing new materials and forms, tackling controversial topics, advocating unpopular ideas or solutions.</i>	Actively seeks out and follows through on untested and potentially risky directions or approaches to the assignment in the final product.	Incorporates new directions or approaches to the assignment in the final product.	Considers new directions or approaches without going beyond the guidelines of the assignment.	Stays strictly within the guidelines of the assignment.
Solving Problems	Not only develops a logical, consistent plan to solve problem, but recognizes consequences of solution and can articulate reason for choosing solution.	Having selected from among alternatives, develops a logical, consistent plan to solve the problem.	Considers and rejects less acceptable approaches to solving problem.	Only a single approach is considered and is used to solve the problem.
Embracing Contradictions	Integrates alternate, divergent, or contradictory perspectives or ideas fully.	Incorporates alternate, divergent, or contradictory perspectives or ideas in a exploratory way.	Includes (recognizes the value of) alternate, divergent, or contradictory perspectives or ideas in a small way.	Acknowledges (mentions in passing) alternate, divergent, or contradictory perspectives or ideas.
Innovative Thinking <i>Novelty or uniqueness (of idea, claim, question, form, etc.)</i>	Extends a novel or unique idea, question, format, or product to create new knowledge or knowledge that crosses boundaries.	Creates a novel or unique idea, question, format, or product.	Experiments with creating a novel or unique idea, question, format, or product.	Reformulates a collection of available ideas.
Connecting, Synthesizing, Transforming	Transforms ideas or solutions into entirely new forms.	Synthesizes ideas or solutions into a coherent whole.	Connects ideas or solutions in novel ways.	Recognizes existing connections among ideas or solutions.

INQUIRY AND ANALYSIS VALUE RUBRIC

for more information, please contact value@aacu.org



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Definition

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

Framing Language

This rubric is designed for use in a wide variety of disciplines. Since the terminology and process of inquiry are discipline-specific, an effort has been made to use broad language which reflects multiple approaches and assignments while addressing the fundamental elements of sound inquiry and analysis (including topic selection, existing knowledge, design, analysis, etc.) The rubric language assumes that the inquiry and analysis process carried out by the student is appropriate for the discipline required. For example, if analysis using statistical methods is appropriate for the discipline then a student would be expected to use an appropriate statistical methodology for that analysis. If a student does not use a discipline-appropriate process for any criterion, that work should receive a performance rating of "1" or "0" for that criterion.

In addition, this rubric addresses the **products** of analysis and inquiry, not the **processes** themselves. The complexity of inquiry and analysis tasks is determined in part by how much information or guidance is provided to a student and how much the student constructs. The more the student constructs, the more complex the inquiry process. For this reason, while the rubric can be used if the assignments or purposes for work are unknown, it will work most effectively when those are known. Finally, faculty are encouraged to adapt the essence and language of each rubric criterion to the disciplinary or interdisciplinary context to which it is applied.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- Conclusions: A synthesis of key findings drawn from research/ evidence.
- Limitations: Critique of the process or evidence.
- Implications: How inquiry results apply to a larger context or the real world.

INQUIRY AND ANALYSIS VALUE RUBRIC

for more information, please contact value@aacu.org



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 (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Topic selection	Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.	Identifies a focused and manageable/ doable topic that appropriately addresses relevant aspects of the topic.	Identifies a topic that while manageable/ doable, 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 doable.
Existing Knowledge, Research, and/or Views	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.
Design Process	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, incorrectly developed, or unfocused.	Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.
Analysis	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.
Conclusions	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.
Limitations and Implications	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.

INTEGRATIVE LEARNING VALUE RUBRIC

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Definition

Integrative learning is an understanding and a disposition that a student builds across the curriculum and co-curriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus.

Framing Language

Fostering students' abilities to integrate learning—across courses, over time, and between campus and community life—is one of the most important goals and challenges for higher education. Initially, students connect previous learning to new classroom learning. Later, significant knowledge within individual disciplines serves as the foundation, but integrative learning goes beyond academic boundaries. Indeed, integrative experiences often occur as learners address real-world problems, unscripted and sufficiently broad, to require multiple areas of knowledge and multiple modes of inquiry, offering multiple solutions and benefiting from multiple perspectives. Integrative learning also involves internal changes in the learner. These internal changes, which indicate growth as a confident, lifelong learner, include the ability to adapt one's intellectual skills, to contribute in a wide variety of situations, and to understand and develop individual purpose, values and ethics. Developing students' capacities for integrative learning is central to personal success, social responsibility, and civic engagement in today's global society. Students face a rapidly changing and increasingly connected world where integrative learning becomes not just a benefit...but a necessity.

Because integrative learning is about making connections, this learning may not be as evident in traditional academic artifacts such as research papers and academic projects unless the student, for example, is prompted to draw implications for practice. These connections often surface, however, in reflective work, self assessment, or creative endeavors of all kinds. Integrative assignments foster learning between courses or by connecting courses to experientially-based work. Work samples or collections of work that include such artifacts give evidence of integrative learning. Faculty are encouraged to look for evidence that the student connects the learning gained in classroom study to learning gained in real life situations that are related to other learning experiences, extra-curricular activities, or work. Through integrative learning, students pull together their entire experience inside and outside of the formal classroom; thus, artificial barriers between formal study and informal or tacit learning become permeable. Integrative learning, whatever the context or source, builds upon connecting both theory and practice toward a deepened understanding.

Assignments to foster such connections and understanding could include, for example, composition papers that focus on topics from biology, economics, or history; mathematics assignments that apply mathematical tools to important issues and require written analysis to explain the implications and limitations of the mathematical treatment, or art history presentations that demonstrate aesthetic connections between selected paintings and novels. In this regard, some majors (e.g., interdisciplinary majors or problem-based field studies) seem to inherently evoke characteristics of integrative learning and result in work samples or collections of work that significantly demonstrate this outcome. However, fields of study that require accumulation of extensive and high-consensus content knowledge (such as accounting, engineering, or chemistry) also involve the kinds of complex and integrative constructions (e.g., ethical dilemmas and social consciousness) that seem to be highlighted so extensively in self reflection in arts and humanities, but they may be embedded in individual performances and less evident. The key in the development of such work samples or collections of work will be in designing structures that include artifacts and reflective writing or feedback that support students' examination of their learning and give evidence that, as graduates, they will extend their integrative abilities into the challenges of personal, professional, and civic life.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- ⑩ Academic knowledge: Disciplinary learning; learning from academic study, texts, etc.
- ⑩ Content: The information conveyed in the work samples or collections of work.
- ⑩ Contexts: Actual or simulated situations in which a student demonstrates learning outcomes. New and challenging contexts encourage students to stretch beyond their current frames of reference.
- ⑩ Co-curriculum: A parallel component of the academic curriculum that is in addition to formal classroom (student government, community service, residence hall activities, student organizations, etc.).
- ⑩ Experience: Learning that takes place in a setting outside of the formal classroom, such as workplace, service learning site, internship site or another.
- ⑩ Form: The external frameworks in which information and evidence are presented, ranging from choices for particular work sample or collection of works (such as a research paper, PowerPoint, video recording, etc.) to choices in make-up of the portfolio.
- ⑩ Performance: A dynamic and sustained act that brings together knowing and doing (creating a painting, solving an experimental design problem, developing a public relations strategy for a business, etc.); performance makes learning observable.
- ⑩ Reflection: A meta-cognitive act of examining a performance in order to explore its significance and consequences.
- ⑩ Self Assessment: Describing, interpreting, and judging a performance based on stated or implied expectations followed by planning for further learning.

PROBLEM SOLVING VALUE RUBRIC

for more information, please contact value@aacu.org



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Definition

Problem solving is the process of designing, evaluating and implementing a strategy to answer an open-ended question or achieve a desired goal.

Framing Language

Problem-solving covers a wide range of activities that may vary significantly across disciplines. Activities that encompass problem-solving by students may involve problems that range from well-defined to ambiguous in a simulated or laboratory context, or in real-world settings. This rubric distills the common elements of most problem-solving contexts and is designed to function across all disciplines. It is broad-based enough to allow for individual differences among learners, yet is concise and descriptive in its scope to determine how well students have maximized their respective abilities to practice thinking through problems in order to reach solutions.

This rubric is designed to measure the quality of a **process**, rather than the quality of an **end-product**. As a result, work samples or collections of work will need to include some evidence of the individual's thinking about a problem-solving task (e.g., reflections on the process from problem to proposed solution; steps in a problem-based learning assignment; record of think-aloud protocol while solving a problem). The final product of an assignment that required problem resolution is insufficient without insight into the student's problem-solving process. Because the focus is on institutional level assessment, scoring team projects, such as those developed in capstone courses, may be appropriate as well.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- Contextual Factors: Constraints (such as limits on cost), resources, attitudes (such as biases) and desired additional knowledge which affect how the problem can be best solved in the real world or simulated setting.
- Critique: Involves analysis and synthesis of a full range of perspectives.
- Feasible: Workable, in consideration of time-frame, functionality, available resources, necessary buy-in, and limits of the assignment or task.
- “Off the shelf” solution: A simplistic option that is familiar from everyday experience but not tailored to the problem at hand (e.g. holding a bake sale to "save" an underfunded public library).
- Solution: An appropriate response to a challenge or a problem.
- Strategy: A plan of action or an approach designed to arrive at a solution. (If the problem is a river that needs to be crossed, there could be a construction-oriented, cooperative (build a bridge with your community) approach and a personally oriented, physical (swim across alone) approach. An approach that partially applies would be a personal, physical approach for someone who doesn't know how to swim.
- Support: Specific rationale, evidence, etc. for solution or selection of solution.

PROBLEM SOLVING VALUE RUBRIC

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Definition

Problem solving is the process of designing, evaluating, and implementing a strategy to answer an open-ended question or achieve a desired goal.

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

	Capstone 4	Milestones		Benchmark 1
		3	2	
Define Problem	Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors.	Demonstrates the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.	Begins to demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, but problem statement is superficial.	Demonstrates a limited ability in identifying a problem statement or related contextual factors.
Identify Strategies	Identifies multiple approaches for solving the problem that apply within a specific context.	Identifies multiple approaches for solving the problem, only some of which apply within a specific context.	Identifies only a single approach for solving the problem that does apply within a specific context.	Identifies one or more approaches for solving the problem that do not apply within a specific context.
Propose Solutions/Hypotheses	Proposes one or more solutions/hypotheses that indicates a deep comprehension of the problem. Solution/hypotheses are sensitive to contextual factors as well as all of the following: ethical, logical, and cultural dimensions of the problem.	Proposes one or more solutions/hypotheses that indicates comprehension of the problem. Solutions/hypotheses are sensitive to contextual factors as well as the one of the following: ethical, logical, or cultural dimensions of the problem.	Proposes one solution/hypothesis that is “off the shelf” rather than individually designed to address the specific contextual factors of the problem.	Proposes a solution/hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.
Evaluate Potential Solutions	Evaluation of solutions is deep and elegant (for example, contains thorough and insightful explanation) and includes, deeply and thoroughly, all of the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is adequate (for example, contains thorough explanation) and includes the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is brief (for example, explanation lacks depth) and includes the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is superficial (for example, contains cursory, surface level explanation) and includes the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.
Implement Solution	Implements the solution in a manner that addresses thoroughly and deeply multiple contextual factors of the problem.	Implements the solution in a manner that addresses multiple contextual factors of the problem in a surface manner.	Implements the solution in a manner that addresses the problem statement but ignores relevant contextual factors.	Implements the solution in a manner that does not directly address the problem statement.
Evaluate Outcomes	Reviews results relative to the problem defined with thorough, specific considerations of need for further work.	Reviews results relative to the problem defined with some consideration of need for further work.	Reviews results in terms of the problem defined with little, if any, consideration of need for further work.	Reviews results superficially in terms of the problem defined with no consideration of need for further work

RESOURCES

Written Communication

WPA Outcomes Statement for First-Year Composition (v3.0) (adopted 17 July 2014)

Introduction

This Statement identifies outcomes for first-year composition programs in U.S. postsecondary education. It describes the writing knowledge, practices, and attitudes that undergraduate students develop in first-year composition, which at most schools is a required general education course or sequence of courses. This Statement therefore attempts to both represent and regularize writing programs' priorities for first-year composition, which often takes the form of one or more required general education courses. To this end it is not merely a compilation or summary of what currently takes place. Rather, this Statement articulates what composition teachers nationwide have learned from practice, research, and theory.¹ It intentionally defines only "outcomes," or types of results, and not "standards," or precise levels of achievement. The setting of standards to measure students' achievement of these Outcomes has deliberately been left to local writing programs and their institutions.

In this Statement "composing" refers broadly to complex writing processes that are increasingly reliant on the use of digital technologies. Writers also attend to elements of design, incorporating images and graphical elements into texts intended for screens as well as printed pages. Writers' composing activities have always been shaped by the technologies available to them, and digital technologies are changing writers' relationships to their texts and audiences in evolving ways.

These outcomes are supported by a large body of research demonstrating that the process of learning to write in any medium is complex: it is both individual and social and demands continued practice and informed guidance. Programmatic decisions about helping students demonstrate these outcomes should be informed by an understanding of this research.

As students move beyond first-year composition, their writing abilities do not merely improve. Rather, their abilities will diversify along disciplinary, professional, and civic lines as these writers move into new settings where expected outcomes expand, multiply, and diverge. Therefore, this document advises faculty in all disciplines about how to help students build on what they learn in introductory writing courses.

Rhetorical Knowledge

Rhetorical knowledge is the ability to analyze contexts and audiences and then to act on that analysis in comprehending and creating texts. Rhetorical knowledge is the basis of composing. Writers develop rhetorical knowledge by negotiating purpose, audience, context, and conventions as they compose a variety of texts for different situations. -

By the end of first-year composition, students should

- Learn and use key rhetorical concepts through analyzing and composing a variety of texts
- Gain experience reading and composing in several genres to understand how genre conventions shape and are shaped by readers' and writers' practices and purposes
- Develop facility in responding to a variety of situations and contexts calling for purposeful shifts in voice, tone, level of formality, design, medium, and/or structure
- Understand and use a variety of technologies to address a range of audiences

¹ This Statement is aligned with the *Framework for Success in Postsecondary Writing*, an articulation of the skills and habits of mind essential for success in college, and is intended to help establish a continuum of valued practice from high school through to the college major.

- Match the capacities of different environments (e.g., print and electronic) to varying rhetorical situations

Faculty in all programs and departments can build on this preparation by helping students learn

- The expectations of readers in their fields
- The main features of genres in their fields
- The main purposes of composing in their fields

Critical Thinking, Reading, and Composing

Critical thinking is the ability to analyze, synthesize, interpret, and evaluate ideas, information, situations, and texts. When writers think critically about the materials they use--whether print texts, photographs, data sets, videos, or other materials--they separate assertion from evidence, evaluate sources and evidence, recognize and evaluate underlying assumptions, read across texts for connections and patterns, identify and evaluate chains of reasoning, and compose appropriately qualified and developed claims and generalizations. These practices are foundational for advanced academic writing.

By the end of first-year composition, students should

- Use composing and reading for inquiry, learning, critical thinking, and communicating in various rhetorical contexts
- Read a diverse range of texts, attending especially to relationships between assertion and evidence, to patterns of organization, to the interplay between verbal and nonverbal elements, and to how these features function for different audiences and situations
- Locate and evaluate (for credibility, sufficiency, accuracy, timeliness, bias and so on) primary and secondary research materials, including journal articles and essays, books, scholarly and professionally established and maintained databases or archives, and informal electronic networks and internet sources
- Use strategies--such as interpretation, synthesis, response, critique, and design/redesign--to compose texts that integrate the writer's ideas with those from appropriate sources

Faculty in all programs and departments can build on this preparation by helping students learn

- The kinds of critical thinking important in their disciplines
- The kinds of questions, problems, and evidence that define their disciplines
- Strategies for reading a range of texts in their fields

Processes

Writers use multiple strategies, or *composing processes*, to conceptualize, develop, and finalize projects. Composing processes are seldom linear: a writer may research a topic before drafting, then conduct additional research while revising or after consulting a colleague. Composing processes are also flexible: successful writers can adapt their composing processes to different contexts and occasions.

By the end of first-year composition, students should

- Develop a writing project through multiple drafts
- Develop flexible strategies for reading, drafting, reviewing, collaborating, revising, rewriting, rereading, and editing
- Use composing processes and tools as a means to discover and reconsider ideas
- Experience the collaborative and social aspects of writing processes
- Learn to give and to act on productive feedback to works in progress
- Adapt composing processes for a variety of technologies and modalities

- Reflect on the development of composing practices and how those practices influence their work

Faculty in all programs and departments can build on this preparation by helping students learn

- To employ the methods and technologies commonly used for research and communication within their fields
- To develop projects using the characteristic processes of their fields
- To review work-in-progress for the purpose of developing ideas before surface-level editing
- To participate effectively in collaborative processes typical of their field

Knowledge of Conventions

Conventions are the formal rules and informal guidelines that define genres, and in so doing, shape readers' and writers' perceptions of correctness or appropriateness. Most obviously, conventions govern such things as mechanics, usage, spelling, and citation practices. But they also influence content, style, organization, graphics, and document design.

Conventions arise from a history of use and facilitate reading by invoking common expectations between writers and readers. These expectations are not universal; they vary by genre (conventions for lab notebooks and discussion-board exchanges differ), by discipline (conventional moves in literature reviews in Psychology differ from those in English), and by occasion (meeting minutes and executive summaries use different registers). A writer's grasp of conventions in one context does not mean a firm grasp in another. Successful writers understand, analyze, and negotiate conventions for purpose, audience, and genre, understanding that genres evolve in response to changes in material conditions and composing technologies and attending carefully to emergent conventions.

By the end of first-year composition, students should

- Develop knowledge of linguistic structures, including grammar, punctuation, and spelling, through practice in composing and revising
- Understand why genre conventions for structure, paragraphing, tone, and mechanics vary
- Gain experience negotiating variations in genre conventions
- Learn common **formats** and/or **design features** for different kinds of texts
- Explore the concepts of intellectual property (such as fair use and copyright) that motivate documentation conventions
- Practice applying citation conventions systematically in their own work

Faculty in all programs and departments can build on this preparation by helping students learn

- The reasons behind conventions of usage, specialized vocabulary, format, and citation systems in their fields or disciplines
- Strategies for controlling conventions in their fields or disciplines
- Factors that influence the ways work is designed, documented, and disseminated in their fields
- Ways to make informed decisions about intellectual property issues connected to common genres and modalities in their fields.

Writing Assessment: A Position Statement



last edited 4 months, 3 weeks ago

[content history](#)

Prepared by CCCC Committee on Assessment, November 2006 (revised March 2009, reaffirmed November 2014)

Introduction

Writing assessment can be used for a variety of appropriate purposes, both inside the classroom and outside: providing assistance to students, awarding a grade, placing students in appropriate courses, allowing them to exit a course or sequence of courses, certifying proficiency, and evaluating programs—to name some of the more obvious. Given the high stakes nature of many of these assessment purposes, it is crucial that assessment practices be guided by sound principles to insure that they are valid, fair, and appropriate to the context and purposes for which they designed. This position statement aims to provide that guidance.

In spite of the diverse uses to which writing assessment is put, the general principles undergirding it are similar:

Assessments of written literacy should be designed and evaluated by well-informed current or future teachers of the students being assessed, for purposes clearly understood by all the participants; should elicit from student writers a variety of pieces, preferably over a substantial period of time; should encourage and reinforce good teaching practices; and should be solidly grounded in the latest research on language learning as well as accepted best assessment practices.

Guiding Principles for Assessment

1. Writing assessment is useful primarily as a means of improving teaching and learning. The primary purpose of any assessment should govern its design, its implementation, and the generation and dissemination of its results.

As a result...

A. Best assessment practice is informed by pedagogical and curricular goals, which are in turn formatively affected by the assessment. Teachers or administrators designing assessments should ground the assessment in the classroom, program or departmental context. The goals or outcomes assessed should lead to assessment data which is fed back to those involved with the regular activities assessed so that assessment results may be used to make changes in practice.

B. Best assessment practice is undertaken in response to local goals, not external pressures. Even when external forces require assessment, the local community must assert control of the assessment process, including selection of the assessment instrument and criteria.

C. Best assessment practice provides regular professional development opportunities. Colleges, universities, and secondary schools should make use of assessments as opportunities for professional development and for the exchange of information about student abilities and institutional expectations.

2. Writing is by definition social. Learning to write entails learning to accomplish a range of purposes for a range of audiences in a range of settings.

As a result...

A. Best assessment practice engages students in contextualized, meaningful writing. The assessment of writing must strive to set up writing tasks and situations that identify purposes appropriate to and appealing to the particular students being tested. Additionally, assessment must be contextualized in terms of why, where, and for what purpose it is being undertaken; this context must also be clear to the students being assessed and to all stakeholders.

B. Best assessment practice supports and harmonizes with what practice and research have demonstrated to be effective ways of teaching writing. What is easiest to measure—often by means of a multiple choice test—may correspond least to good writing; choosing a correct response from a set of possible answers is not composing. As important, just asking students to write does not make the assessment instrument a good one. Essay tests that ask students to form and articulate opinions about some important issue, for instance, without time to reflect, talk to others, read on the subject, revise, and have a human audience promote distorted notions of what writing is. They also encourage poor teaching and little learning. Even teachers who recognize and employ the methods used by real writers in working with students can find their best efforts undercut by assessments such as these.

C. Best assessment practice is direct assessment by human readers. Assessment that isolates students and forbids discussion and feedback from others conflicts with what we know about language use and the benefits of social interaction during the writing process; it also is out of step with much classroom practice. Direct assessment in the classroom should provide response that serves formative purposes, helping writers develop and shape ideas, as well as organize, craft sentences, and edit. As stated by the CCCC Position Statement on Teaching, Learning, and Assessing Writing in Digital Environments, "we oppose the use of machine-scored writing in the assessment of writing." Automated assessment programs do not respond as human readers. While they may promise consistency, they distort the very nature of writing as a complex and context-rich interaction between people. They simplify writing in ways that can mislead writers to focus more on structure and grammar than on what they are saying by using a given structure and style.

3. Any individual's writing ability is a sum of a variety of skills employed in a diversity of contexts, and individual ability fluctuates unevenly among these varieties.

As a result...

A. Best assessment practice uses multiple measures. One piece of writing—even if it is generated under the most desirable conditions—can never serve as an indicator of overall writing ability, particularly for high-stakes decisions. Ideally, writing ability must be assessed by more than one piece of writing, in more than one genre, written on different occasions, for different audiences, and responded to and evaluated by multiple readers as part of a substantial and sustained writing process.

B. Best assessment practice respects language variety and diversity and assesses writing on the basis of effectiveness for readers, acknowledging that as purposes vary, criteria will as well. Standardized tests that rely more on identifying grammatical and stylistic errors than authentic rhetorical choices disadvantage students whose home dialect is not the dominant dialect. Assessing authentic acts of writing simultaneously raises performance standards and provides multiple avenues to success. Thus students are not arbitrarily punished for linguistic differences that in some contexts make them more, not less, effective communicators. Furthermore, assessments that are keyed closely to an American cultural context may disadvantage second language writers. The CCCC Statement on Second Language Writing and Writers calls on us "to recognize the regular presence of second-language writers in writing classes, to understand their characteristics, and to develop instructional and administrative practices that are sensitive to their linguistic and cultural needs." Best assessment practice responds to this call by creating assessments that are sensitive to the language varieties in use among the local population and sensitive to the context-specific outcomes being assessed.

C. Best assessment practice includes assessment by peers, instructors, and the student writer himself or herself. Valid assessment requires combining multiple perspectives on a performance and generating an overall assessment out of the combined descriptions of those multiple perspectives. As a result, assessments should include formative and summative assessments from all these kinds of readers. Reflection by the writer on her or his own writing processes and performances holds particular promise as a way of generating knowledge about writing and increasing the ability to write successfully.

4. Perceptions of writing are shaped by the methods and criteria used to assess writing.

As a result...

A. The methods and criteria that readers use to assess writing should be locally developed, deriving from the particular context and purposes for the writing being assessed. The individual writing program, institution, or consortium, should be recognized as a community of interpreters whose knowledge of context and purpose is integral to the assessment. There is no test which can be used in all environments for all purposes, and the best assessment for any group of students must be locally determined and may well be locally designed.

B. Best assessment practice clearly communicates what is valued and expected, and does not distort the nature of writing or writing practices. If ability to compose for various audiences is valued, then an assessment will assess this capability. For other contexts and purposes, other writing abilities might be valued, for instance, to develop a position on the basis of reading multiple sources or to compose a multi-media piece, using text and images. Values and purposes should drive assessment, not the reverse. A corollary to this statement is that assessment practices and criteria should change as conceptions of texts and values change.

C. Best assessment practice enables students to demonstrate what they do well in writing. Standardized tests tend to focus on readily accessed features of the language (grammatical correctness, stylistic choices) and on error rather than on the appropriateness of the rhetorical choices that have been made. Consequently, the outcome of such assessments is negative: students are said to demonstrate what they do wrong with language rather than what they do well. Quality assessments will provide the opportunity for students to demonstrate the ways they can write, displaying the strategies or skills taught in the relevant environment.

5. Assessment programs should be solidly grounded in the latest research on learning, writing, and assessment.

As a result...

A. Best assessment practice results from careful consideration of the costs and benefits of the range of available approaches. It may be tempting to choose an inexpensive, quick assessment, but decision-makers should consider the impact of assessment methods on students, faculty, and programs. The return on investment from the direct assessment of writing by instructor-evaluators includes student learning, professional development of faculty, and program development. These benefits far outweigh the presumed benefits of cost, speed, and simplicity that machine scoring might seem to promise.

B. Best assessment practice is continually under review and subject to change by well-informed faculty, administrators, and legislators. Anyone charged with the responsibility of designing an assessment program must be cognizant of the relevant research and must stay abreast of developments in the field. The theory and practice of writing assessment is continually informed by significant publications in professional journals and by presentations at regional and national conferences. The easy availability of this research to practitioners makes ignorance of its content reprehensible.

Applications to Assessment Settings

The guiding principles apply to assessment conducting in any setting. In addition, we offer the following guidelines for situations that may be encountered in specific settings.

Assessment in the Classroom

In a course context, writing assessment should be part of the highly social activity within the community of faculty and students in the class. This social activity includes:

- a period of ungraded work (prior to the completion of graded work) that receives response from multiple readers, including peer reviewers,
- assessment of texts—from initial through to final drafts—by human readers, and
- more than one opportunity to demonstrate outcomes.

Self-assessment should also be encouraged. Assessment practices and criteria should match the particular kind of text being created and its purpose. These criteria should be clearly communicated to students in advance so that the students can be guided by the criteria while writing.

Assessment for Placement

Placement criteria in the most responsible programs will be clearly connected to any differences in the available courses. Experienced instructor-evaluators can most effectively make a judgment regarding which course would best serve each student's needs and assign each student to the appropriate course. If scoring systems are used, scores should derive from criteria that grow out of the work of the courses into which students are being placed.

Decision-makers should carefully weigh the educational costs and benefits of timed tests, portfolios, directed self placement, etc. In the minds of those assessed, each of these methods implicitly establishes its value over that of others, so the first impact is likely to be on what students come to believe about writing. For example, timed writing may suggest to students that writing always cramps one for time and that real writing is always a test. Machine-scored tests may focus students on error-correction rather than on effective communication. In contrast, the value of portfolio assessment is that it honors the processes by which writers develop their ideas and re-negotiate how their communications are heard within a language community.

Students should have the right to weigh in on their assessment. Self-placement without direction may become merely a right to fail, whereas *directed* self-placement, either alone or in combination with other methods, provides not only useful information but also involves and invests the student in making effective life decisions.

If for financial or even programmatic reasons the initial method of placement is somewhat reductive, instructors of record should create an opportunity early in the semester to review and change students' placement assignments, and uniform procedures should be established to facilitate the easy re-placement of improperly placed students. Even when the placement process entails direct assessment of writing, the system should accommodate the possibility of improper placement. If assessment employs machine scoring, whether of actual writing or of items designed to elicit error, it is particularly essential that every effort be made through statistical verification to see that students, individually and collectively, are placed in courses that can appropriately address their skills and abilities.

Placement processes should be continually assessed and revised in accord with course content and overall program goals. This is especially important when machine-scored assessments are used. Using methods that are employed uniformly, teachers of record should verify that students are appropriately placed. If students are placed according to scores on such tests, the ranges of placement must be revisited regularly to accommodate changes in curricula and shifts in the abilities of the student population.

Assessment of Proficiency

Proficiency or exit assessment involves high stakes for students. In this context, assessments that make use of substantial and sustained writing processes are especially important.

Judgments of proficiency must also be made on the basis of performances in multiple and varied writing situations (for example, a variety of topics, audiences, purposes, genres).

The assessment criteria should be clearly connected to desired outcomes. When proficiency is being determined, the assessment should be informed by such things as the core abilities adopted by the institution, the course outcomes established for a program, and/or the stated outcomes of a single course or class. Assessments that do not address such outcomes lack validity in determining proficiency.

The higher the stakes, the more important it is that assessment be direct rather than indirect, based on actual writing rather than on answers on multiple-choice tests, and evaluated by people involved in the instruction of the student rather than via machine scoring. To evaluate the proficiency of a writer on other criteria than multiple writing tasks and situations is essentially disrespectful of the writer.

Assessment of Programs

Program assessment refers to evaluations of performance in a large group, such as students in a multi-section course or majors graduating from a department. Because assessment offers information about student performance and the factors which affect that performance, it is an important way for programs or departments to monitor and develop their practice.

Programs and departments should see themselves as communities of professionals whose assessment activities reveal common values, provide opportunities for inquiry and debate about unsettled issues, and communicate measures of effectiveness to those inside and outside the program. Members of the community are in the best position to guide decisions about what assessments will best inform that community. It is important to bear in mind that random sampling of students can often provide large-scale information and that regular assessment should affect practice.

Assessment for School Admission

Admissions tests are not only high stakes for students, they are also an extremely important component for educational institutions determining if they and a student are an appropriate match. Consequently, where students' writing ability is a factor in the admissions decision, the writing assessments should consist of direct measures of actual writing. Moreover, the assessment should consist of multiple writing tasks and should allow sufficient time for a student to engage in all stages of the writing process.

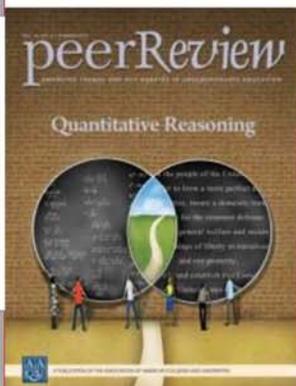
Assessments should be appropriate to educational institutions' distinctive missions and student populations, although similar institutions may collaborate to create assessments. Assessment should be developed in consultation with high school writing teachers.

RESOURCES

Quantitative Reasoning



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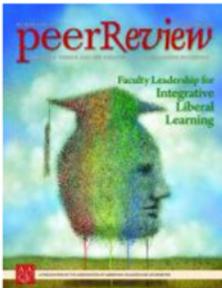
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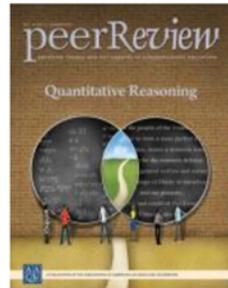
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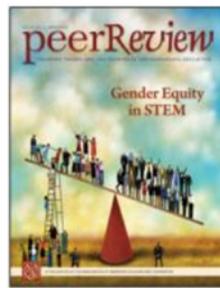
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RESOURCES

Critical Thinking & Information Literacy



Information Literacy Competency Standards for Higher Education



*Approved by the Board of Directors of the
Association of College and Research Libraries on January 18, 2000*

*Endorsed by the American Association for Higher Education (October 1999)
and the Council of Independent Colleges (February 2004)*

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The *Information Literacy Competency Standards for Higher Education* are available for downloading at: <http://www.ala.org/acrl/standards/informationliteracycompetency>.

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*Information Literacy
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Chicago, Illinois

Information Literacy Competency Standards for Higher Education

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Information Literacy Defined

Information literacy is a set of abilities requiring individuals to “recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.”¹ Information literacy also is increasingly important in the contemporary environment of rapid technological change and proliferating information resources. Because of the escalating complexity of this environment, individuals are faced with diverse, abundant information choices—in their academic studies, in the workplace, and in their personal lives. Information is available through libraries, community resources, special interest organizations, media, and the Internet—and increasingly, information comes to individuals in unfiltered formats, raising questions about its authenticity, validity, and reliability. In addition, information is available through multiple media, including graphical, aural, and textual, and these pose new challenges for individuals in evaluating and understanding it. The uncertain quality and expanding quantity of information pose large challenges for society. The sheer abundance of information will not in itself create a more informed citizenry without a complementary cluster of abilities necessary to use information effectively.

Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:

- ◆ Determine the extent of information needed
- ◆ Access the needed information effectively and efficiently

- ◆ Evaluate information and its sources critically
- ◆ Incorporate selected information into one’s knowledge base
- ◆ Use information effectively to accomplish a specific purpose
- ◆ Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally

Information Literacy and Information Technology

Information literacy is related to information technology skills, but has broader implications for the individual, the educational system, and for society. Information technology skills enable an individual to use computers, software applications, databases, and other technologies to achieve a wide variety of academic, work-related, and personal goals. Information literate individuals necessarily develop some technology skills.

Information literacy, while showing significant overlap with information technology skills, is a distinct and broader area of competence. Increasingly, information technology skills are interwoven with, and support, information literacy. A 1999 report from the National Research Council promotes the concept of “fluency” with information technology and delineates several distinctions useful in understanding relationships among information literacy, computer literacy, and broader technological competence. The report notes that “computer literacy” is concerned with rote learning of specific hardware and software applications, while “fluency with technology” focuses on understanding the underlying concepts of technology and applying problem-solving and critical thinking to using technology. The report also discusses differences between information technology fluency and information literacy as it is understood in K-12 and higher education. Among these are information literacy’s focus on content, communication, analysis, information searching, and evaluation; whereas information technology “fluency” focuses on a deep understanding of technology and graduated, increasingly skilled use of it.²

“Fluency” with information technology may require more intellectual abilities than the rote learning of software and hardware associated with “computer literacy”, but the focus is still on the technology itself. Information literacy, on the other hand, is an intellectual framework for understanding, finding, evaluating, and using information—activities which may be accomplished in part by fluency with information technology, in part by sound investigative methods, but most important, through critical discernment and reasoning. Information literacy initiates, sustains, and extends lifelong learning through abilities which may use technologies but are ultimately independent of them.

Information Literacy and Higher Education

Developing lifelong learners is central to the mission of higher education institutions. By ensuring that individuals have the intellectual abilities of reasoning and critical thinking, and by helping them construct a framework for learning how to learn, colleges and universities provide the foundation for continued growth throughout their careers, as well as in their roles as informed citizens and members of communities. Information literacy is a key component of, and contributor to, lifelong learning. Information literacy competency extends learning beyond formal classroom settings and provides practice with self-directed investigations as individuals move into internships, first professional positions, and increasing responsibilities in all arenas of life. Because information literacy augments students' competency with evaluating, managing, and using information, it is now considered by several regional and discipline-based accreditation associations as a key outcome for college students.³

For students not on traditional campuses, information resources are often available through networks and other channels, and distributed learning technologies permit teaching and learning to occur when the teacher and the student are not in the same place at the same time. The challenge for those promoting information literacy in distance education courses is to develop a comparable range of experiences in learning about information resources as are offered on traditional campuses. Information literacy competencies for distance learning students should be comparable to those for "on campus" students.

Incorporating information literacy across curricula, in all programs and services, and throughout the administrative life of the university, requires the collaborative efforts of faculty, librarians, and administrators. Through lectures and by leading discussions, faculty establish the context for learning. Faculty also inspire students to explore the unknown, offer guidance on how best to fulfill information needs, and monitor students' progress. Academic librarians coordinate the evaluation and selection of intellectual resources for programs and services; organize, and maintain collections and many points of access to information; and provide instruction to students and faculty who seek information. Administrators create opportunities for collaboration and staff development among faculty, librarians, and other professionals who initiate information literacy programs, lead in planning and budgeting for those programs, and provide ongoing resources to sustain them.

Information Literacy and Pedagogy

The Boyer Commission Report, *Reinventing Undergraduate Education*, recommends strategies that require the student to engage actively in "framing of a significant question or set of questions, the research or creative exploration to find answers, and the communications skills to convey

the results...”⁴ Courses structured in such a way create student-centered learning environments where inquiry is the norm, problem solving becomes the focus, and thinking critically is part of the process. Such learning environments require information literacy competencies.

Gaining skills in information literacy multiplies the opportunities for students’ self-directed learning, as they become engaged in using a wide variety of information sources to expand their knowledge, ask informed questions, and sharpen their critical thinking for still further self-directed learning. Achieving competency in information literacy requires an understanding that this cluster of abilities is not extraneous to the curriculum but is woven into the curriculum’s content, structure, and sequence. This curricular integration also affords many possibilities for furthering the influence and impact of such student-centered teaching methods as problem-based learning, evidence-based learning, and inquiry learning. Guided by faculty and others in problem-based approaches, students reason about course content at a deeper level than is possible through the exclusive use of lectures and textbooks. To take fullest advantage of problem-based learning, students must often use thinking skills requiring them to become skilled users of information sources in many locations and formats, thereby increasing their responsibility for their own learning.

To obtain the information they seek for their investigations, individuals have many options. One is to utilize an information retrieval system, such as may be found in a library or in databases accessible by computer from any location. Another option is to select an appropriate investigative method for observing phenomena directly. For example, physicians, archaeologists, and astronomers frequently depend upon physical examination to detect the presence of particular phenomena. In addition, mathematicians, chemists, and physicists often utilize technologies such as statistical software or simulators to create artificial conditions in which to observe and analyze the interaction of phenomena. As students progress through their undergraduate years and graduate programs, they need to have repeated opportunities for seeking, evaluating, and managing information gathered from multiple sources and discipline-specific research methods.

Use of the Standards

*I*nformation Literacy Competency Standards for Higher Education provides a framework for assessing the information literate individual. It also extends the work of the American Association of School Librarians Task Force on Information Literacy Standards, thereby providing higher education an opportunity to articulate its information literacy competencies with those of K-12 so that a continuum of expectations develops for students at all levels. The competencies presented here outline the process by which faculty, librarians and others pinpoint specific indicators that identify a student as information literate.

Students also will find the competencies useful, because they provide students with a framework for gaining control over how they interact with information in their environment. It will help to sensitize them to the need to develop a metacognitive approach to learning, making them conscious of the explicit actions required for gathering, analyzing, and using information. All students are expected to demonstrate all of the competencies described in this document, but not everyone will demonstrate them to the same level of proficiency or at the same speed.

Furthermore, some disciplines may place greater emphasis on the mastery of competencies at certain points in the process, and therefore certain competencies would receive greater weight than others in any rubric for measurement. Many of the competencies are likely to be performed recursively, in that the reflective and evaluative aspects included within each standard will require the student to return to an earlier point in the process, revise the information-seeking approach, and repeat the same steps.

To implement the standards fully, an institution should first review its mission and educational goals to determine how information literacy would improve learning and enhance the institution's effectiveness. To facilitate acceptance of the concept, faculty and staff development is also crucial.

Information Literacy and Assessment

In the following competencies, there are five standards and twenty-two performance indicators. The standards focus upon the needs of students in higher education at all levels. The standards also list a range of outcomes for assessing student progress toward information literacy. These outcomes serve as guidelines for faculty, librarians, and others in developing local methods for measuring student learning in the context of an institution's unique mission. In addition to assessing all students' basic information literacy skills, faculty and librarians should also work together to develop assessment instruments and strategies in the context of particular disciplines, as information literacy manifests itself in the specific understanding of the knowledge creation, scholarly activity, and publication processes found in those disciplines.

In implementing these standards, institutions need to recognize that different levels of thinking skills are associated with various learning outcomes—and therefore different instruments or methods are essential to assess those outcomes. For example, both “higher order” and “lower order” thinking skills, based on Bloom's Taxonomy of Educational Objectives, are evident throughout the outcomes detailed in this document. It is strongly suggested that assessment methods appropriate to the thinking skills associated with each outcome be identified as an integral part of the institution's implementation plan.

For example, the following outcomes illustrate “higher order” and “lower order” thinking skills:

“Lower Order” thinking skill:

Outcome 2.2.a. Identifies keywords, synonyms, and related terms for the information needed.

“Higher Order” thinking skill:

Outcome 3.3.b. Extends initial synthesis, when possible, to a higher level of abstraction to construct new hypotheses that may require additional information.

Faculty, librarians, and others will find that discussing assessment methods collaboratively is a very productive exercise in planning a systematic, comprehensive information literacy program. This assessment program should reach all students, pinpoint areas for further program development, and consolidate learning goals already achieved. It also should make explicit to the institution’s constituencies how information literacy contributes to producing educated students and citizens.

Notes

1. American Library Association. *Presidential Committee on Information Literacy. Final Report*. (Chicago: American Library Association, 1989.) <http://www.ala.org/acrl/publications/whitepapers/presidential>.

2. National Research Council. Commission on Physical Sciences, Mathematics, and Applications. Committee on Information Technology Literacy, Computer Science and Telecommunications Board. *Being Fluent with Information Technology*. Publication. (Washington, D.C.: National Academy Press, 1999) <http://www.nap.edu/openbook.php?isbn=030906399X>.

3. Several key accrediting agencies concerned with information literacy are: The Middle States Commission on Higher Education (MSCHE), the Western Association of Schools and College (WASC), and the Southern Association of Colleges and Schools (SACS).

4. Boyer Commission on Educating Undergraduates in the Research University. *Reinventing Undergraduate Education: A Blueprint for America’s Research Universities*. http://www.niu.edu/engagedlearning/research/pdfs/Boyer_Report.pdf.

Standards, Performance Indicators, and Outcomes

Standard One

The information literate student determines the nature and extent of the information needed.

Performance Indicators:

1. The information literate student defines and articulates the need for information.

Outcomes Include:

- a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need
 - b. Develops a thesis statement and formulates questions based on the information need
 - c. Explores general information sources to increase familiarity with the topic
 - d. Defines or modifies the information need to achieve a manageable focus
 - e. Identifies key concepts and terms that describe the information need
 - f. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information
2. The information literate student identifies a variety of types and formats of potential sources for information.

Outcomes Include:

- a. Knows how information is formally and informally produced, organized, and disseminated
 - b. Recognizes that knowledge can be organized into disciplines that influence the way information is accessed
 - c. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)
 - d. Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical)
 - e. Differentiates between primary and secondary sources, recognizing how their use and importance vary with each discipline
 - f. Realizes that information may need to be constructed with raw data from primary sources
3. The information literate student considers the costs and benefits of acquiring the needed information.

Outcomes Include:

- a. Determines the availability of needed information and makes decisions on broadening the information seeking process beyond local resources (e.g., interlibrary loan; using resources at other locations; obtaining images, videos, text, or sound)
 - b. Considers the feasibility of acquiring a new language or skill (e.g., foreign or discipline-based) in order to gather needed information and to understand its context
 - c. Defines a realistic overall plan and timeline to acquire the needed information
4. The information literate student reevaluates the nature and extent of the information need.

Outcomes Include:

- a. Reviews the initial information need to clarify, revise, or refine the question
- b. Describes criteria used to make information decisions and choices

Standard Two

The information literate student accesses needed information effectively and efficiently.

Performance Indicators:

1. The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.

Outcomes Include:

- a. Identifies appropriate investigative methods (e.g., laboratory experiment, simulation, fieldwork)
 - b. Investigates benefits and applicability of various investigative methods
 - c. Investigates the scope, content, and organization of information retrieval systems
 - d. Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system
2. The information literate student constructs and implements effectively-designed search strategies.

Outcomes Include:

- a. Develops a research plan appropriate to the investigative method
- b. Identifies keywords, synonyms and related terms for the information needed
- c. Selects controlled vocabulary specific to the discipline or information retrieval source

- d. Constructs a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books)
 - e. Implements the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages, protocols, and search parameters
 - f. Implements the search using investigative protocols appropriate to the discipline
3. The information literate student retrieves information online or in person using a variety of methods.

Outcomes Include:

- a. Uses various search systems to retrieve information in a variety of formats
 - b. Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration
 - c. Uses specialized online or in person services available at the institution to retrieve information needed (e.g., interlibrary loan/document delivery, professional associations, institutional research offices, community resources, experts and practitioners)
 - d. Uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information
4. The information literate student refines the search strategy if necessary.

Outcomes Include:

- a. Assesses the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized
 - b. Identifies gaps in the information retrieved and determines if the search strategy should be revised
 - c. Repeats the search using the revised strategy as necessary
5. The information literate student extracts, records, and manages the information and its sources.

Outcomes Include:

- a. Selects among various technologies the most appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments)
- b. Creates a system for organizing the information
- c. Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources

- d. Records all pertinent citation information for future reference
- e. Uses various technologies to manage the information selected and organized

Standard Three

The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

Performance Indicators:

1. The information literate student summarizes the main ideas to be extracted from the information gathered.

Outcomes Include:

- a. Reads the text and selects main ideas
 - b. Restates textual concepts in his/her own words and selects data accurately
 - c. Identifies verbatim material that can be then appropriately quoted
2. The information literate student articulates and applies initial criteria for evaluating both the information and its sources.

Outcomes Include:

- a. Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias
 - b. Analyzes the structure and logic of supporting arguments or methods
 - c. Recognizes prejudice, deception, or manipulation
 - d. Recognizes the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information
3. The information literate student synthesizes main ideas to construct new concepts.

Outcomes Include:

- a. Recognizes interrelationships among concepts and combines them into potentially useful primary statements with supporting evidence
- b. Extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information
- c. Utilizes computer and other technologies (e.g. spreadsheets, databases, multimedia, and audio or visual equipment) for studying the interaction of ideas and other phenomena

4. The information literate student compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information.

Outcomes Include:

- a. Determines whether information satisfies the research or other information need
 - b. Uses consciously selected criteria to determine whether the information contradicts or verifies information used from other sources
 - c. Draws conclusions based upon information gathered
 - d. Tests theories with discipline-appropriate techniques (e.g., simulators, experiments)
 - e. Determines probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions
 - f. Integrates new information with previous information or knowledge
 - g. Selects information that provides evidence for the topic
5. The information literate student determines whether the new knowledge has an impact on the individual's value system and takes steps to reconcile differences.

Outcomes Include:

- a. Investigates differing viewpoints encountered in the literature
 - b. Determines whether to incorporate or reject viewpoints encountered
6. The information literate student validates understanding and interpretation of the information through discourse with other individuals, subject-area experts, and/or practitioners.

Outcomes Include:

- a. Participates in classroom and other discussions
 - b. Participates in class-sponsored electronic communication forums designed to encourage discourse on the topic (e.g., e-mail, bulletin boards, chat rooms)
 - c. Seeks expert opinion through a variety of mechanisms (e.g., interviews, e-mail, listservs)
7. The information literate student determines whether the initial query should be revised.

Outcomes Include:

- a. Determines if original information need has been satisfied or if additional information is needed
- b. Reviews search strategy and incorporates additional concepts as necessary

- c. Reviews information retrieval sources used and expands to include others as needed

Standard Four

The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

Performance Indicators:

1. The information literate student applies new and prior information to the planning and creation of a particular product or performance.

Outcomes Include:

- a. Organizes the content in a manner that supports the purposes and format of the product or performance (e.g. outlines, drafts, storyboards)
 - b. Articulates knowledge and skills transferred from prior experiences to planning and creating the product or performance
 - c. Integrates the new and prior information, including quotations and paraphrasings, in a manner that supports the purposes of the product or performance
 - d. Manipulates digital text, images, and data, as needed, transferring them from their original locations and formats to a new context
2. The information literate student revises the development process for the product or performance.

Outcomes Include:

- a. Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process
 - b. Reflects on past successes, failures, and alternative strategies
3. The information literate student communicates the product or performance effectively to others.

Outcomes Include:

- a. Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience
- b. Uses a range of information technology applications in creating the product or performance
- c. Incorporates principles of design and communication
- d. Communicates clearly and with a style that supports the purposes of the intended audience

Standard Five

The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

Performance Indicators:

1. The information literate student understands many of the ethical, legal and socio-economic issues surrounding information and information technology.

Outcomes Include:

- a. Identifies and discusses issues related to privacy and security in both the print and electronic environments
 - b. Identifies and discusses issues related to free vs. fee-based access to information
 - c. Identifies and discusses issues related to censorship and freedom of speech
 - d. Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material
2. The information literate student follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources.

Outcomes Include:

- a. Participates in electronic discussions following accepted practices (e.g. "Netiquette")
 - b. Uses approved passwords and other forms of ID for access to information resources
 - c. Complies with institutional policies on access to information resources
 - d. Preserves the integrity of information resources, equipment, systems and facilities
 - e. Legally obtains, stores, and disseminates text, data, images, or sounds
 - f. Demonstrates an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own
 - g. Demonstrates an understanding of institutional policies related to human subjects research
3. The information literate student acknowledges the use of information sources in communicating the product or performance.

Outcomes Include:

- a. Selects an appropriate documentation style and uses it consistently to cite sources
- b. Posts permission granted notices, as needed, for copyrighted material

Appendix I: Selected Information Literacy Initiatives

- ◆ In 1989 the American Library Association (ALA) Presidential Committee on Information Literacy issued a *Final Report* which defined four components of information literacy: the ability to recognize when information is needed and to locate, evaluate and use effectively the needed information. <http://www.ala.org/acrl/publications/whitepapers/presidential>.
- ◆ In 1990, the National Forum on Information Literacy (NFIL) was founded as a response to the recommendations of the ALA Presidential Committee *Final Report*. NFIL is a “coalition of over 75 education, business, and governmental organizations working to promote international and national awareness of the need for information literacy and encouraging activities leading to its acquisition.” Forum members promote information literacy nationally, internationally, and within their own programs. <http://infolit.org/>.
- ◆ In March 1998 NFIL issued, *A Progress Report on Information Literacy: An Update on the American Library Association Presidential Committee on Information Literacy: Final Report*. <http://www.ala.org/acrl/publications/whitepapers/progressreport>.
- ◆ In 1998 the American Association of School Libraries (AASL) and the Association of Educational Communications and Technology (AECT) published *Information Literacy Standards for Student Learning*. The AASL/AECT standards detail competencies for students in K-12.
- ◆ Since 1989, in the absence of national standards, many states, school districts, state university systems, and local institutions have developed information literacy competency standards. <http://www.fiu.edu/~library/ili/iliweb.html>.

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Citing the standards

American Psychological Association (APA Style)

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Framework for Information Literacy for Higher Education

Filed by the ACRL Board February 2, 2015, as one of the constellation of information literacy documents from the association.

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Introduction

This *Framework for Information Literacy for Higher Education (Framework)* grows out of a belief that information literacy as an educational reform movement will realize its potential only through a richer, more complex set of core ideas. During the fifteen years since the publication of the *Information Literacy Competency Standards for Higher Education*,¹ academic librarians and their partners in higher education associations have developed learning outcomes, tools, and resources that some institutions have deployed to infuse information literacy concepts and skills into their curricula. However, the rapidly changing higher education environment, along with the dynamic and often uncertain information ecosystem in which all of us work and live, require new attention to be focused on foundational ideas about that ecosystem. Students have a greater role and responsibility in²³¹ creating new knowledge, in understanding the contours and the changing dynamics of the

world of information, and in using information, data, and scholarship ethically. Teaching faculty have a greater responsibility in designing curricula and assignments that foster enhanced engagement with the core ideas about information and scholarship within their disciplines. Librarians have a greater responsibility in identifying core ideas within their own knowledge domain that can extend learning for students, in creating a new cohesive curriculum for information literacy, and in collaborating more extensively with faculty.

The *Framework* offered here is called a framework intentionally because it is based on a cluster of interconnected core concepts, with flexible options for implementation, rather than on a set of standards, learning outcomes, or any prescriptive enumeration of skills. At the heart of this *Framework* are conceptual understandings that organize many other concepts and ideas about information, research, and scholarship into a coherent whole. These conceptual understandings are informed by the work of Wiggins and McTighe,² which focuses on essential concepts and questions in developing curricula and focuses on *threshold concepts*.³ Threshold concepts are those ideas in any discipline that are passageways or portals to enlarged understanding or ways of thinking and practicing within that discipline. This *Framework* draws upon an ongoing Delphi Study that has identified several threshold concepts in information literacy,⁴ but the *Framework* has been molded using fresh ideas and emphases for the threshold concepts. Two added elements illustrate important learning goals related to those concepts: *knowledge practices*,⁵ which are demonstrations of ways in which learners can increase their understanding of these information literacy concepts and *dispositions*,⁶ which describe ways in which to address the affective, attitudinal, or valuing dimension of learning. The *Framework* is organized into six frames, each consisting of a concept central to information literacy, a set of knowledge practices, and a set of dispositions. The six concepts that anchor the frames are presented alphabetically:

1. Authority Is Constructed and Contextual
2. Information Creation as a Process
3. Information Has Value
4. Research as Inquiry
5. Scholarship as Conversation
6. Searching as Strategic Exploration

Neither the knowledge practices nor the dispositions that support each concept are intended to prescribe what local institutions should do in using the *Framework*; each library and its partners on campus will need to deploy these frames to best fit their own situation, including designing learning outcomes. For the same reason, these lists should not be considered exhaustive.

In addition, this *Framework* draws significantly upon the concept of metaliteracy,⁷ which offers a renewed vision of information literacy as an overarching set of abilities in which students are consumers and creators of information who can participate successfully in collaborative spaces.⁸ Metaliteracy demands behavioral, affective, cognitive, and metacognitive engagement with the information ecosystem. This *Framework* depends on these core ideas of metaliteracy, with special focus on metacognition,⁹ or critical self-reflection, as crucial to becoming more self-directed in that rapidly changing ecosystem.

Because this *Framework* envisions information literacy as extending the arc of learning throughout students' academic careers and as converging with other academic and social learning goals, an expanded definition of information literacy is offered here to emphasize dynamism, flexibility, individual growth, and community learning:

Information literacy is the set of integrated abilities encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning.

The *Framework* opens the way for librarians, faculty, and other institutional partners to redesign instruction sessions, assignments, courses, and even curricula; to connect information literacy with student success initiatives; to collaborate on pedagogical research and involve students themselves in that research; and to create wider conversations about student learning, the scholarship of teaching and learning, and the assessment of learning on local campuses and beyond.

Notes

1. Association of College & Research Libraries, Information Literacy Competency Standards for Higher Education (Chicago, 2000).
2. Grant Wiggins and Jay McTighe. *Understanding by Design*. (Alexandria, VA: Association for Supervision and Curriculum Development, 2004).
3. Threshold concepts are core or foundational concepts that, once grasped by the learner, create new perspectives and ways of understanding a discipline or challenging knowledge domain. Such concepts produce transformation within the learner; without them, the learner does not acquire expertise in that field of knowledge. Threshold concepts can be thought of as portals through which the learner must pass to develop new perspectives and wider understanding. Jan H. F. Meyer, Ray Land, and Caroline Baillie. "Editors' Preface." In *Threshold Concepts and Transformational Learning*, edited by Jan H. F. Meyer, Ray Land, and Caroline Baillie, ix–xlii. (Rotterdam, Netherlands: Sense Publishers, 2010).
4. For information on this unpublished, in-progress Delphi Study on threshold concepts and information literacy, conducted by Lori Townsend, Amy Hofer, Silvia Lu, and Korey Brunetti, see <http://www.ilthresholdconcepts.com/>. Lori Townsend, Korey Brunetti, and Amy R. Hofer. "Threshold Concepts and Information Literacy." *portal: Libraries and the Academy* 11, no. 3 (2011): 853–69.
5. Knowledge practices are the proficiencies or abilities that learners develop as a result of their comprehending a threshold concept.
6. Generally, a disposition is a tendency to act or think in a particular way. More specifically, a disposition is a cluster of preferences, attitudes, and intentions, as well as a set of capabilities that allow the preferences to become realized in a particular way. Gavriel Salomon. "To Be or Not to Be (Mindful)." Paper presented at the American Educational Research Association Meetings, New Orleans, LA, 1994.
7. Metaliteracy expands the scope of traditional information skills (i.e., determine, access, locate, understand, produce, and use information) to include the collaborative production and sharing of information in participatory digital environments (collaborate, produce, and share). This approach requires an ongoing adaptation to emerging technologies and an understanding of the critical thinking and reflection required to engage in these spaces as producers, collaborators, and distributors. Thomas P. Mackey and Trudi E. Jacobson. *Metaliteracy: Reinventing Information Literacy to Empower Learners*. (Chicago: Neal-Schuman, 2014).

8. Thomas P. Mackey and Trudi E. Jacobson. "Reframing Information Literacy as a Metaliteracy." *College and Research Libraries* 72, no. 1 (2011): 62–78.

9. Metacognition is an awareness and understanding of one's own thought processes. It focuses on how people learn and process information, taking into consideration people's awareness of how they learn. (Jennifer A. Livingston. "Metacognition: An Overview." Online paper, State University of New York at Buffalo, Graduate School of Education, 1997. <http://gse.buffalo.edu/fas/shuell/cep564/metacog.htm>.)

Frames

These six frames are presented alphabetically and do not suggest a particular sequence in which they must be learned.

Authority Is Constructed and Contextual

Information resources reflect their creators' expertise and credibility, and are evaluated based on the information need and the context in which the information will be used. Authority is constructed in that various communities may recognize different types of authority. It is contextual in that the information need may help to determine the level of authority required.

Experts understand that authority is a type of influence recognized or exerted within a community. Experts view authority with an attitude of informed skepticism and an openness to new perspectives, additional voices, and changes in schools of thought. Experts understand the need to determine the validity of the information created by different authorities and to acknowledge biases that privilege some sources of authority over others, especially in terms of others' worldviews, gender, sexual orientation, and cultural orientations. An understanding of this concept enables novice learners to critically examine all evidence—be it a short blog post or a peer-reviewed conference proceeding—and to ask relevant questions about origins, context, and suitability for the current information need. Thus, novice learners come to respect the expertise that authority represents while remaining skeptical of the systems that have elevated that authority and the information created by it. Experts know how to seek authoritative voices but also recognize that unlikely voices can be authoritative, depending on need. Novice learners may need to rely on basic indicators of authority, such as type of publication or author credentials, where experts recognize schools of thought or discipline-specific paradigms.

Knowledge Practices

Learners who are developing their information literate abilities do the following:

- Define different types of authority, such as subject expertise (e.g., scholarship), societal position (e.g., public office or title), or special experience (e.g., participating in a historic event).
- Use research tools and indicators of authority to determine the credibility of sources, understanding the elements that might temper this credibility.
- Understand that many disciplines have acknowledged authorities in the sense of well-known scholars and publications that are widely considered "standard". Even in those situations, some scholars would challenge the authority of those sources.
- Recognize that authoritative content may be packaged formally or informally and

- may include sources of all media types.
- Acknowledge they are developing their own authoritative voices in a particular area and recognize the responsibilities this entails, including seeking accuracy and reliability, respecting intellectual property, and participating in communities of practice.
 - Understand the increasingly social nature of the information ecosystem where authorities actively connect with one another and sources develop over time.

Dispositions

Learners who are developing their information literate abilities do the following:

- Develop and maintain an open mind when encountering varied and sometimes conflicting perspectives
- Motivate themselves to find authoritative sources, recognizing that authority may be conferred or manifested in unexpected ways
- Develop awareness of the importance of assessing content with a skeptical stance and with a self-awareness of their own biases and worldview
- Question traditional notions of granting authority and recognize the value of diverse ideas and worldviews
- Are conscious that maintaining these attitudes and actions requires frequent self-evaluation

Information Creation as a Process

Information in any format is produced to convey a message and is shared via a selected delivery method. The iterative processes of researching, creating, revising, and disseminating information vary, and the resulting product reflects these differences.

The information creation process could result in a range of information formats and modes of delivery, so experts look beyond format when selecting resources to use. The unique capabilities and constraints of each creation process as well as the specific information need determine how the product is used. Experts recognize that information creations are valued differently in different contexts, such as academia or the workplace. Elements that affect or reflect on the creation, such as a pre- or post-publication editing or reviewing process, may be indicators of quality. The dynamic nature of information creation and dissemination requires ongoing attention to understand evolving creation processes. Recognizing the nature of information creation, experts look to the underlying processes of creation as well as the final product to critically evaluate the usefulness of the information. Novice learners begin to recognize the significance of the creation process, leading them to increasingly sophisticated choices when matching information products with their information needs.

Knowledge Practices

Learners who are developing their information literate abilities do the following:

- Articulate the capabilities and constraints of information developed through various creation processes
- Assess the fit between an information product's creation process and a particular information need

- Articulate the traditional and emerging processes of information creation and dissemination in a particular discipline
- Recognize that information may be perceived differently based on the format in which it is packaged
- Recognize the implications of information formats that contain static or dynamic information
- Monitor the value that is placed upon different types of information products in varying contexts
- Transfer knowledge of capabilities and constraints to new types of information products
- Develop, in their own creation processes, an understanding that their choices impact the purposes for which the information product will be used and the message it conveys

Dispositions

Learners who are developing their information literate abilities do the following:

- Are inclined to seek out characteristics of information products that indicate the underlying creation process
- Value the process of matching an information need with an appropriate product
- Accept that the creation of information may begin initially through communicating in a range of formats or modes
- Accept the ambiguity surrounding the potential value of information creation expressed in emerging formats or modes
- Resist the tendency to equate format with the underlying creation process
- Understand that different methods of information dissemination with different purposes are available for their use

Information Has Value

Information possesses several dimensions of value, including as a commodity, as a means of education, as a means to influence, and as a means of negotiating and understanding the world. Legal and socioeconomic interests influence information production and dissemination.

The value of information is manifested in various contexts, including publishing practices, information access, the commodification of personal information, and intellectual property laws. The novice learner may struggle to understand the diverse values of information in an environment where “free” information and related services are plentiful and the concept of intellectual property is first encountered through rules of citation or warnings about plagiarism and copyright law. As creators and users of information, experts understand their rights and responsibilities when participating in a community of scholarship. Experts understand that value may be wielded by powerful interests in ways that marginalize certain voices. However, value may be leveraged by individuals and organizations to effect change and may be leveraged for civic, economic, social, or personal gains. Experts also understand the individual is responsible for making deliberate and informed choices about when to comply with and when to contest current legal and socioeconomic practices concerning the value of information.

Learners who are developing their information literate abilities do the following:

- Give credit to the original ideas of others through proper attribution and citation
- Understand that intellectual property is a legal and social construct that varies by culture
- Articulate the purpose and distinguishing characteristics of copyright, fair use, open access, and the public domain
- Understand how and why some individuals or groups of individuals may be underrepresented or systematically marginalized within the systems that produce and disseminate information
- Recognize issues of access or lack of access to information sources
- Decide where and how their information is published
- Understand how the commodification of their personal information and online interactions affects the information they receive and the information they produce or disseminate online
- Make informed choices regarding their online actions in full awareness of issues related to privacy and the commodification of personal information

Dispositions

Learners who are developing their information literate abilities do the following:

- Respect the original ideas of others
- Value the skills, time, and effort needed to produce knowledge
- See themselves as contributors to the information marketplace rather than only consumers of it
- Are inclined to examine their own information privilege

Research as Inquiry

Research is iterative and depends upon asking increasingly complex or new questions whose answers in turn develop additional questions or lines of inquiry in any field.

Experts see inquiry as a process that focuses on problems or questions in a discipline or between open or unresolved disciplines. Experts recognize the collaborative effort within a discipline to extend the knowledge in that field. Many times, this process includes points of disagreement where debate and dialogue work to deepen the conversations around knowledge. This process of inquiry extends beyond the academic world to the community at large, and the process of inquiry may focus upon personal, professional, or societal needs. The spectrum of inquiry ranges from asking simple questions that depend upon basic recapitulation of knowledge to increasingly sophisticated abilities to refine research questions, use more advanced research methods, and explore more diverse disciplinary perspectives. Novice learners acquire strategic perspectives on inquiry and a greater repertoire of investigative methods.

Knowledge Practices

Learners who are developing their information literate abilities do the following:

- Formulate questions for research based on information gaps or on reexamination of existing, possibly conflicting, information

- Determine an appropriate scope of investigation
- Deal with complex research by breaking complex questions into simple ones, limiting the scope of investigations
- Use various research methods, based on need, circumstance, and type of inquiry
- Monitor gathered information and assess for gaps or weaknesses
- Organize information in meaningful ways
- Synthesize ideas gathered from multiple sources
- Draw reasonable conclusions based on the analysis and interpretation of information

Dispositions

Learners who are developing their information literate abilities do the following:

- Consider research as open-ended exploration and engagement with information
- Appreciate that a question may appear to be simple but still disruptive and important to research
- Value intellectual curiosity in developing questions and learning new investigative methods
- Maintain an open mind and a critical stance
- Value persistence, adaptability, and flexibility and recognize that ambiguity can benefit the research process
- Seek multiple perspectives during information gathering and assessment
- Seek appropriate help when needed
- Follow ethical and legal guidelines in gathering and using information
- Demonstrate intellectual humility (i.e., recognize their own intellectual or experiential limitations)

Scholarship as Conversation

Communities of scholars, researchers, or professionals engage in sustained discourse with new insights and discoveries occurring over time as a result of varied perspectives and interpretations.

Research in scholarly and professional fields is a discursive practice in which ideas are formulated, debated, and weighed against one another over an extended time. Instead of seeking discrete answers to complex problems, experts understand that a given issue may be characterized by several competing perspectives as part of an ongoing conversation in which information users and creators come together and negotiate meaning. Experts understand that, though some topics have established answers through this process, a query may have more than one uncontested answer. Experts are, therefore, inclined to seek out many perspectives, not merely the ones with which they are familiar. These perspectives might be in their own discipline or profession or may be in other fields. Even though novice learners and experts at all levels can take part in the conversation, established power and authority structures may influence their ability to participate and can privilege certain voices and information. Developing familiarity with the sources of evidence, methods, and modes of discourse in the field assists novice learners to enter the conversation. New forms of scholarly and research conversations provide more avenues in which a wide variety of individuals may have a voice in the conversation. Providing attribution to relevant previous research is also an obligation of participation in the conversation. It enables the conversation to move forward and strengthens one's voice in the conversation.

Knowledge Practices

Learners who are developing their information literate abilities do the following:

- Cite the contributing work of others in their own information production
- Contribute to scholarly conversation at an appropriate level, such as local online community, guided discussion, undergraduate research journal, conference presentation/poster session
- Identify barriers to entering scholarly conversation via various venues
- Critically evaluate contributions made by others in participatory information environments
- Identify the contribution particular articles, books, and other scholarly pieces make to disciplinary knowledge
- Summarize the changes in scholarly perspective over time on a particular topic within a specific discipline
- Recognize that a given scholarly work may not represent the only or even the majority perspective on the issue

Dispositions

Learners who are developing their information literate abilities do the following:

- Recognize they are often entering into an ongoing scholarly conversation and not a finished conversation
- Seek out conversations taking place in their research area
- See themselves as contributors to scholarship rather than only consumers of it
- Recognize that scholarly conversations take place in various venues
- Suspend judgment on the value of a particular piece of scholarship until the larger context for the scholarly conversation is better understood
- Understand the responsibility that comes with entering the conversation through participatory channels
- Value user-generated content and evaluate contributions made by others
- Recognize that systems **privilege** authorities and that not having a fluency in the language and process of a discipline disempowers their ability to participate and engage

Searching as Strategic Exploration

Searching for information is often nonlinear and iterative, requiring the evaluation of a range of information sources and the mental flexibility to pursue alternate avenues as new understanding develops.

The act of searching often begins with a question that directs the act of finding needed information. Encompassing inquiry, discovery, and serendipity, searching identifies possible relevant sources and the means to access those sources. Experts realize that information searching is a contextualized, complex experience that affects, and is affected by, the searcher's cognitive, affective, and social dimensions. Novice learners may search a limited set of resources, and experts may search more broadly and deeply to determine the most appropriate information within the project scope. Likewise, novice learners tend to use few search strategies; experts select from various search strategies, depending on the sources, scope, and context of the information need.

Knowledge Practices

Learners who are developing their information literate abilities do the following:

- Determine the initial scope of the task required to meet their information needs
- Identify interested parties, such as scholars, organizations, governments, and industries, which might produce information about a topic and determine how to access that information
- Utilize divergent (e.g., brainstorming) and convergent (e.g., selecting the best source) thinking when searching
- Match information needs and search strategies to search tools
- Design and refine needs and search strategies, based on search results
- Understand how information systems (i.e., collections of recorded information) are organized to access relevant information
- Use different searching language types (e.g., controlled vocabulary, keywords, natural language)
- Manage searching processes and results

Dispositions

Learners who are developing their information literate abilities do the following:

- Exhibit mental flexibility and creativity
- Understand that first attempts at searching do not always produce adequate results
- Realize that information sources vary greatly in content and format and have varying relevance and value, depending on the needs and nature of the search
- Seek guidance from experts, such as librarians, researchers, and professionals
- Recognize the value of browsing and other serendipitous methods of information gathering
- Persist in the face of search challenges, and know when enough information completes the information task

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Critical Thinking: What It Is and Why It Counts

Peter A. Facione

The late George Carlin worked “critical thinking” into one of his comedic monologue rants on the perils of trusting our lives and fortunes to the decision-making of people who were gullible, uninformed, and unreflective. Had he lived to experience the economic collapse of 2008 and 2009, he would have surely added more to his caustic but accurate assessments regarding how failing to anticipate the consequences of one’s decisions often leads to disastrous results not only for the decision maker, but for many other people as well.

After years of viewing higher education as more of a private good which benefits only the student, we are again beginning to appreciate higher education as being also a public good which benefits society. Is it not a wiser social policy to invest in the education of the future workforce, rather than to suffer the financial costs and endure the fiscal and social burdens associated with economic weakness, public

health problems, crime, and avoidable poverty? Perhaps that realization, along with its obvious advantages for high level strategic decision making, is what lead the Chairman of the Joint Chiefs of Staff to comment on critical thinking in his commencement address to a graduating class of military officers.

You will recall how you were inspired to **THINK CRITICALLY** and to question without fear, to seek out radically different solutions and to voice them without reprisal, to read widely and deeply, and to examine without end and grow intellectually. . . .
What I ask is this: pass it on.

Navy Adm. Mike Mullen, June 11, 2009

Teach people to make good decisions and you equip them to improve

their own futures and become contributing members of society, rather than burdens on society. Becoming educated and practicing good judgment does not absolutely guarantee a life of happiness, virtue, or economic success, but it surely offers a better chance at those things. And it is clearly better than enduring the consequences of making bad decisions and better than burdening friends, family, and all the rest of us with the unwanted and avoidable consequences of those poor choices.

Defining “Critical Thinking”

Yes, surely we have all heard business executives, policy makers, civic leaders, and educators talking about critical thinking. At times we found ourselves wondering exactly what critical thinking was and why is it considered so useful and important. This essay takes a deeper look at these questions.

But, rather than beginning with an abstract definition – as if critical thinking were about memorization, which is not the case – give this thought experiment a try: Imagine you have been invited to a movie by a friend. But it’s not a movie you want to see. So, your friend asks you why. You give your honest reason. The movie offends your sense of decency. Your friend asks you to clarify your reason by explaining what bothers you about the film. You reply that it is not the language used or the sexuality portrayed, but you find the violence in the film offensive.

Sure, that should be a good enough answer. But suppose your friend, perhaps being a bit philosophically inclined or simply curious or argumentative, pursues the matter further by asking you to define what you mean by “offensive violence.”

Take a minute and give it a try. How would you define “offensive violence” as it applies to movies? Can you write a characterization which captures what this commonly used concept contains? Take

care, though, we would not want to make the definition so broad that all movie violence would be automatically “offensive.” And check to be sure your way of defining “offensive violence” fits with how the rest of the people who know and use English would understand the term. Otherwise they will not be able to understand what you mean when you use that expression.

Did you come up with a definition that works? How do you know?

What you just did with the expression “offensive violence” is very much the same as what had to be done with the expression “critical thinking.” At one level we all know what “critical thinking” means — it means good thinking, almost the opposite of illogical, irrational, thinking. But when we test our understanding further, we run into questions. For example, is critical thinking the same as creative thinking, are they different, or is one part of the other? How do critical thinking and native intelligence or scholastic aptitude relate? Does critical thinking focus on the subject matter or content that you know or on the process you use when you reason about that content?

It might not hurt at all if you formed some tentative preliminary ideas about the questions we just raised. We humans learn better when we stop frequently to reflect, rather than just plowing from the top of the page to the bottom without coming up for air.

Fine. So how would you propose we go about defining “critical thinking.” You do not really want a definition plopped on the page for you to memorize, do you? That would be silly, almost counterproductive. The goal here is to help you sharpen your critical thinking skills and cultivate your critical thinking spirit. While memorization definitely has many valuable uses, fostering critical thinking is not among them. So, let’s look back at what you might have done to define “offensive violence” and see if we can learn from you. Did you think of some scenes in movies that were offensively violent, and did you contrast them with other

scenes that were either not violent or not offensively violent? If you did, good. That is one (but not the only) way to approach the problem. Technically it is called finding paradigm cases. Happily, like many things in life, you do not have to know its name to do it well.

Nothing in all the world is more dangerous than sincere ignorance and conscientious stupidity.

Martin Luther King, Jr.¹⁶

Back to critical thinking – let's ask ourselves to come up with possible examples of strong critical thinking? How about the adroit and clever questioning of Socrates or a good attorney or interviewer? Or, what about the clever investigative approaches used by police detectives and crime scene analysts? Would we not want to also include people working together to solve a problem as they consider and discuss their options? How about someone who is good at listening to all sides of a dispute, considering all the facts, and then deciding what is relevant and what is not, and then rendering a thoughtful judgment? And maybe too, someone who is able to summarize complex ideas clearly with fairness to all sides, or a person who can come up with the most coherent and justifiable explanation of what a passage of written material means? Or the person who can readily devise sensible alternatives to explore, but who does not become defensive about abandoning them if they do not work? And also the person who can explain exactly how a particular conclusion was reached, or why certain criteria apply?

Or, considering the concept of critical thinking from the opposite direction, we might ask what the consequences of failing to use our critical thinking might be. Imagine

¹ Many useful characterizations of critical thinking by noted theorists and teachers are captured in *Conversations with Critical*

for a moment what could happen when a person or a group of people decides important matters without pausing first to think things through.

Failures of critical thinking contribute to...

patient deaths * lost revenue * ineffective law enforcement * job loss * gullible voters * garbled communications * imprisonment * combat casualties * upside down mortgages * vehicular homicide * bad decisions * unplanned pregnancies * financial mismanagement * heart disease * family violence * repeated suicide attempts * divorce * drug addiction * academic failure * ... * ... *

WHAT WERE WE THINKING?

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Expert Opinion

An international group of experts was asked to try to form a consensus about the meaning of critical thinking.¹ One of the first things they did was to ask themselves the question: Who are the best critical thinkers we know and what is it about them that leads us to consider them the best? So, who are the best critical thinkers you know? Why do you think they are strong critical thinkers? Can you draw from those examples a description that is more abstract? For example, consider effective trial lawyers, apart from how they conduct their personal lives or whether their client is really guilty or innocent, just look at how the lawyers develop their cases in court. They use reasons to try to convince the judge and jury of their client's claim to guilt or innocence. They offer evidence and evaluate the significance of the evidence presented by the opposition lawyers. They interpret testimony. They analyze and evaluate the arguments advanced by the other side.

Thinkers, John Esterle and Dan Clurman (Eds.). Whitman Institute. San Francisco, CA. 1993

Now, consider the example of the team of people trying to solve a problem. The team members, unlike the courtroom's adversarial situation, try to collaborate. The members of an effective team do not compete against each other. They work in concert, like colleagues, for the common goal. Unless they solve the problem, none of them has won. When they find the way to solve the problem, they all have won. So, from analyzing just two examples we can generalize something very important: critical thinking is thinking that has a purpose (proving a point, interpreting what something means, solving a problem), but critical thinking can be a collaborative, noncompetitive endeavor. And, by the way, even lawyers collaborate. They can work together on a common defense or a joint prosecution, and they can also cooperate with each other to get at the truth so that justice is done.

We will come to a more precise definition of critical thinking soon enough. But first, there is something else we can learn from paradigm examples. When you were thinking about "offensive violence" did you come up with any examples that were tough to classify? Borderline cases, as it were — an example that one person might consider offensive but another might reasonably regard as non-offensive. Yes, well, so did we. This is going to happen with all abstract concepts. It happens with the concept of critical thinking as well. There are people of whom we would say, on certain occasions this person is a good thinker, clear, logical, thoughtful, attentive to the facts, open to alternatives, but, wow, at other times, look out! When you get this person on such-and-such a topic, well it is all over then. You have pushed some kind of button and the person does not want to hear what anybody else has to say. The person's mind is made up ahead of time. New facts are pushed aside. No other point of view is tolerated.

Do you know any people that might fit that general description?

Good. What can we learn about critical thinking from such a case? Maybe more than we can learn from just looking at the easy cases. For when a case is on the borderline, it forces us to make important distinctions. It confronts us and demands a decision: In or Out! And not just that, but why? So, our friend who is fair-minded about some things, but close-minded about others, what to do? Let's take the parts we approve of because they seem to us to contribute to acting rationally and logically and include those in the concept of critical thinking, and let's take the parts that work against reason, that close the mind to the possibility of new and relevant information, that blindly deny even the possibility that the other side might have merit, and call those poor, counterproductive, or uncritical thinking.

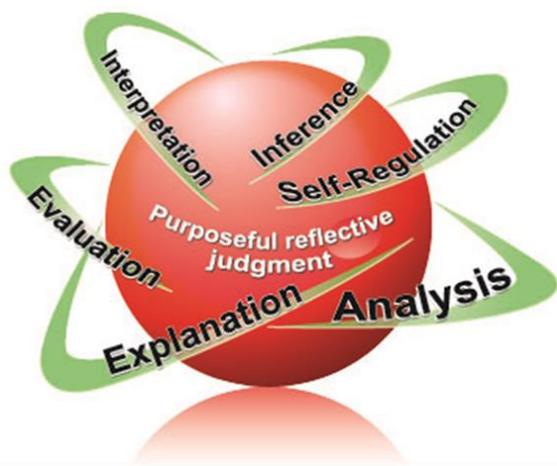
Very few really seek knowledge in this world. Mortal or immortal, few really ask. On the contrary, they try to wring from the unknown the answers they have already shaped in their own minds - justification, explanations, forms of consolation without which they can't go on. To really ask is to open the door to the whirlwind. The answer may annihilate the question and the questioner.

Spoken by the vampire Marius in
*The Vampire Lestat*² 2

Now, formulate a list of cases — people that are clearly strong critical thinkers and clearly weak critical thinkers and some who are on the borderline. Considering all those cases, what is it about them that led you to decide which were which? Suggestion: What can the strong critical thinkers do (what mental abilities do they have), that the weak critical thinkers have trouble doing? What skills or approaches do

² Spoken by the Vampire Marius in Ann Rice's book *The Vampire Lestat* Ballantine Books. New York, NY. 1985.

the strong critical thinkers habitually seem to exhibit which the weak critical thinkers seem not to possess?



Core Critical Thinking Skills

Above we suggested you look for a list of mental skills and habits of mind, the experts, when faced with the same problem you are working on, refer to their lists as including *cognitive skills* and *dispositions*.

As to the cognitive skills here is what the experts include as being at the very core of critical thinking: interpretation, analysis, evaluation, inference, explanation, and self-regulation. (We will get to the dispositions in just a second.) Did any of these words or ideas come up when you tried to characterize the cognitive skills — mental abilities — involved in critical thinking?

Quoting from the consensus statement of the national panel of experts: **interpretation** is “to comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs,

rules, procedures, or criteria.”³ Interpretation includes the sub-skills of categorization, decoding significance, and clarifying meaning. Can you think of examples of interpretation? How about recognizing a problem and describing it without bias? How about reading a person’s intentions in the expression on her face; distinguishing a main idea from subordinate ideas in a text; constructing a tentative categorization or way of organizing something you are studying; paraphrasing someone’s ideas in your own words; or, clarifying what a sign, chart or graph means? What about identifying an author’s purpose, theme, or point of view? How about what you did above when you clarified what “offensive violence” meant?

Again from the experts: **analysis** is “to identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgment, experiences, reasons, information, or opinions.” The experts include examining ideas, detecting arguments, and analyzing arguments as sub-skills of analysis. Again, can you come up with some examples of analysis? What about identifying the similarities and differences between two approaches to the solution of a given problem? What about picking out the main claim made in a newspaper editorial and tracing back the various reasons the editor offers in support of that claim? Or, what about identifying unstated assumptions; constructing a way to represent a main conclusion and the various reasons given to support or criticize it; sketching the relationship of sentences or paragraphs to each other and to the main purpose of the passage? What about graphically organizing this essay, in your

³ The findings of expert consensus cited or reported in this essay are published in *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction*. Peter A. Facione, principle investigator, The California Academic Press, Millbrae, CA, 1990. (ERIC ED 315 423). In 1993/94 the Center for the Study of Higher Education at The Pennsylvania State University undertook a study of 200 policy-makers, employers, and faculty

members from two-year and four-year colleges to determine what this group took to be the core critical thinking skills and habits of mind. The Pennsylvania State University Study, under the direction of Dr. Elizabeth Jones, was funded by the US Department of Education Office of Educational Research and Instruction. The Penn State study findings, published in 1994, confirmed the expert consensus described in this paper.

own way, knowing that its purpose is to give a preliminary idea about what critical thinking means?

The experts define **evaluation** as meaning “to assess the credibility of statements or other representations which are accounts or descriptions of a person’s perception, experience, situation, judgment, belief, or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions or other forms of representation.” Your examples? How about judging an author’s or speaker’s credibility, comparing the strengths and weaknesses of alternative interpretations, determining the credibility of a source of information, judging if two statements contradict each other, or judging if the evidence at hand supports the conclusion being drawn? Among the examples the experts propose are these: “recognizing the factors which make a person a credible witness regarding a given event or a credible authority with regard to a given topic,” “judging if an argument’s conclusion follows either with certainty or with a high level of confidence from its premises,” “judging the logical strength of arguments based on hypothetical situations,” “judging if a given argument is relevant or applicable or has implications for the situation at hand.”

Do the people you regard as strong critical thinkers have the three cognitive skills described so far? Are they good at interpretation, analysis, and evaluation? What about the next three? And your examples of weak critical thinkers, are they lacking in these cognitive skills? All, or just some?

To the experts **inference** means “to identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to deduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other

forms of representation.” As sub-skills of inference the experts list querying evidence, conjecturing alternatives, and drawing conclusions. Can you think of some examples of inference? You might suggest things like seeing the implications of the position someone is advocating, or drawing out or constructing meaning from the elements in a reading. You may suggest that predicting what will happen next based what is known about the forces at work in a given situation, or formulating a synthesis of related ideas into a coherent perspective. How about this: after judging that it would be useful to you to resolve a given uncertainty, developing a workable plan to gather that information? Or, when faced with a problem, developing a set of options for addressing it. What about, conducting a controlled experiment scientifically and applying the proper statistical methods to attempt to confirm or disconfirm an empirical hypothesis?

Beyond being able to interpret, analyze, evaluate and infer, strong critical thinkers can do two more things. They can explain what they think and how they arrived at that judgment. And, they can apply their powers of critical thinking to themselves and improve on their previous opinions. These two skills are called “explanation” and “self-regulation.”

The experts define **explanation** as being able to present in a cogent and coherent way the results of one’s reasoning. This means to be able to give someone a full look at the big picture: both “to state and to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one’s results were based; and to present one’s reasoning in the form of cogent arguments.” The sub-skills under explanation are describing methods and results, justifying procedures, proposing and defending with good reasons one’s causal and conceptual explanations of events or points of view, and presenting full and well-reasoned, arguments in the context of

seeking the best understandings possible. Your examples first, please... Here are some more: to construct a chart which organizes one's findings, to write down for future reference your current thinking on some important and complex matter, to cite the standards and contextual factors used to judge the quality of an interpretation of a text, to state research results and describe the methods and criteria used to achieve those results, to appeal to established criteria as a way of showing the reasonableness of a given judgment, to design a graphic display which accurately represents the subordinate and super-ordinate relationship among concepts or ideas, to cite the evidence that led you to accept or reject an author's position on an issue, to list the factors that were considered in assigning a final course grade.

Maybe the most remarkable cognitive skill of all, however, is this next one. This one is remarkable because it allows strong critical thinkers to improve their own thinking. In a sense this is critical thinking applied to itself. Because of that some people want to call this "meta-cognition," meaning it raises thinking to another level. But "another level" really does not fully capture it, because at that next level up what self-regulation does is look back at all the dimensions of critical thinking and double check itself. Self-regulation is like a recursive function in mathematical terms, which means it can apply to everything, including itself. You can monitor and correct an interpretation you offered. You can examine and correct an inference you have drawn. You can review and reformulate one of your own explanations. You can even examine and correct your ability to examine and correct yourself! How? It is as simple as stepping back and saying to yourself, "How am I

doing? Have I missed anything important? Let me double check before I go further."

The experts define **self-regulation** to mean "self-consciously to monitor one's cognitive activities, the elements used in those activities, and the results educed, particularly by applying skills in analysis, and evaluation to one's own inferential judgments with a view toward questioning, confirming, validating, or correcting either one's reasoning or one's results." The two sub-skills here are self-examination and self-correction. Examples? Easy — to examine your views on a controversial issue with sensitivity to the possible influences of your personal biases or self-interest, to check yourself when listening to a speaker in order to be sure you are understanding what the person is really saying without introducing your own ideas, to monitor how well you seem to be understanding or comprehending what you are reading or experiencing, to remind yourself to separate your personal opinions and assumptions from those of the author of a passage or text, to double check yourself by recalculating the figures, to vary your reading speed and method mindful of the type of material and your purpose for reading, to reconsider your interpretation or judgment in view of further analysis of the facts of the case, to revise your answers in view of the errors you discovered in your work, to change your conclusion in view of the realization that you had misjudged the importance of certain factors when coming to your earlier decision.⁴

⁴ The [California Critical Thinking Skills Test](#), and the [Test of Everyday Reasoning](#), the [Health Science Reasoning Test](#), the [Military and Defense Reasoning Profile](#), the [Business Critical Thinking Skills Test](#), and the [Legal Studies Reasoning Profile](#) along with other testing instruments authored by Dr. Facione and his research team for

people in K-12, college, and graduate / professional work target the core critical thinking skills identified here. These instruments are published in English and several authorized translations exclusively by Insight Assessment.

Questions to Fire Up Our Critical Thinking Skills

Interpretation	<ul style="list-style-type: none"> • What does this mean? • What's happening? • How should we understand that (e.g., what he or she just said)? • What is the best way to characterize/categorize/classify this? • In this context, what was intended by saying/doing that? • How can we make sense out of this (experience, feeling, or statement)?
Analysis	<ul style="list-style-type: none"> • Please tell us again your reasons for making that claim. • What is your conclusion/What is it that you are claiming? • Why do you think that? • What are the arguments pro and con? • What assumptions must we make to accept that conclusion? • What is your basis for saying that?
Inference	<ul style="list-style-type: none"> • Given what we know so far, what conclusions can we draw? • Given what we know so far, what can we rule out? • What does this evidence imply? • If we abandoned/accepted that assumption, how would things change? • What additional information do we need to resolve this question? • If we believed these things, what would they imply for us going forward? • What are the consequences of doing things that way? • What are some alternatives we haven't yet explored? • Let's consider each option and see where it takes us. • Are there any undesirable consequences that we can and should foresee?
Evaluation	<ul style="list-style-type: none"> • How credible is that claim? • Why do we think we can trust what this person claims? • How strong are those arguments? • Do we have our facts right? • How confident can we be in our conclusion, given what we now know?
Explanation	<ul style="list-style-type: none"> • What were the specific findings/results of the investigation? • Please tell us how you conducted that analysis. • How did you come to that interpretation? • Please take us through your reasoning one more time. • Why do you think that (was the right answer/was the solution)? • How would you explain why this particular decision was made?
Self-Regulation	<ul style="list-style-type: none"> • Our position on this issue is still too vague; can we be more precise? • How good was our methodology, and how well did we follow it? • Is there a way we can reconcile these two apparently conflicting conclusions? • How good is our evidence? • OK, before we commit, what are we missing? • I'm finding some of our definitions a little confusing; can we revisit what we mean by certain things before making any final decisions?

Source: © 2014 User Manual for the [California Critical Thinking Skills Test](#), published by Insight Assessment.

The Delphi Research Method

The panel of experts we keep referring to included forty-six men and women from throughout the United States and Canada. They represented many different scholarly disciplines in the humanities, sciences, social sciences, and education. They participated in a research project that lasted two years and was conducted on behalf of the American

Philosophical Association. Their work was published under the title *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction*. (The California Academic Press, Millbrae, CA, 1990). You may download the executive summary of that report free. Visit

www.insightassessment.com

You might be wondering how such a large group of people could collaborate on this project over that long a period of time and at those distances and still come to consensus. Good question. Remember we're talking the days before e-mail.

Not only did the group have to rely on snail mail during their two-year collaboration; they also relied on a method of interaction, known as the Delphi Method, which was developed precisely to enable experts to think effectively about something over large spans of distance and time. In the Delphi Method a central investigator organizes the group and feeds them an initial question. [In this case it had to do with how college level critical thinking should be defined so that people teaching at that level would know which skills and dispositions to cultivate in their students.] The central investigator receives all responses, summarizes them, and transmits them back to all the panelists for reactions, replies, and additional questions.

Wait a minute! These are all well-known experts, so what do you do if people disagree? And what about the possible influence of a big name person? Good points. First, the central investigator takes precautions to remove names so that the panelists are not told who said what. They know who is on the panel, of course. But that is as far as it goes. After that each experts' argument has to stand on its own merits. Second, an expert is only as good as the arguments she or he gives. So, the central investigator summarizes the arguments and lets the panelists decide if they accept them or not. When consensus appears to be at hand, the central investigator proposes this and asks if people agree. If not, then points of disagreement among the experts are registered. We want to share with you one important example of each of these. First we will describe the expert consensus view of the dispositions which are absolutely vital to strong critical thinking. Then we will note a point of separation among the experts.

Core Critical Thinking Skills		
SKILL	Experts' Consensus Description	Subskill
Interpretation	"To comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria"	Categorize Decode significance Clarify meaning
Analysis	"To identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgment, experiences, reasons, information, or opinions"	Examine ideas Identify arguments Identify reasons and claims
Inference	"To identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to reduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation"	Query evidence Conjecture alternatives Draw logically valid or justified conclusions
Evaluation	"To assess the credibility of statements or other representations that are accounts or descriptions of a person's perception, experience, situation, judgment, belief, or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions, or other forms of representation"	Assess credibility of claims Assess quality of arguments that were made using inductive or deductive reasoning

Explanation	“To state and to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one’s results were based; and to present one’s reasoning in the form of cogent arguments”	State results Justify procedures Present arguments
Self-Regulation	“Self-consciously to monitor one’s cognitive activities, the elements used in those activities, and the results deduced, particularly by applying skills in analysis, and evaluation to one’s own inferential judgments with a view toward questioning, confirming, validating, or correcting either one’s reasoning or one’s results”	Self-monitor Self-correct

Source: APA Report: *Expert Consensus Statement on Critical Thinking*. (ERIC ED 315 423)

The Disposition Toward Critical Thinking

What kind of a person would be apt to use their critical thinking skills? The experts poetically describe such a person as having “a critical spirit.” Having a critical spirit does not mean that the person is always negative and hypercritical of everyone and everything.

The experts use the metaphorical phrase **critical spirit** in a *positive* sense. By it they mean “**a probing inquisitiveness, a keenness of mind, a zealous dedication to reason, and a hunger or eagerness for reliable information.**”

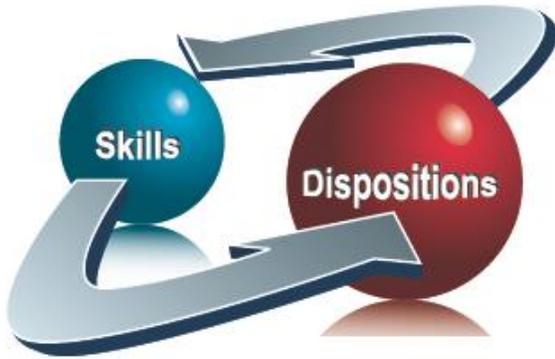
Almost sounds like Supreme Court Justice Sandra Day O’Connor or Sherlock Holmes. The kind of person being described here is the kind that always wants to ask “Why?” or “How?” or “What happens if?”. The one key difference, however, is that in fiction Sherlock always solves the mystery, while in the real world there is no guarantee. Critical thinking is about how you approach problems, questions, issues. It is the best way we know of to get to the truth. But! There still are no guarantees — no answers in the back of the book of real life. Does this characterization, that strong critical thinkers possess a “critical spirit, a probing inquisitiveness, a keenness of mind...” fit with your examples of people you would call strong critical thinkers?

But, you might say, I know people who have skills but do not use them. We cannot call someone a strong critical thinker just because she or he has these cognitive skills, however important they might be, because what if they just do not bother to apply them?

One response is to say that it is hard to imagine an accomplished dancer who never dances. After working to develop those skills it seems such a shame to let them grow weak with lack of practice. But dancers get tired. And they surrender to the stiffness of age or the fear of injury. In the case of critical thinking skills, we might argue that not using them once you have them is hard to imagine. It’s hard to imagine a person deciding not to think.

*Considered as a form of thoughtful judgment or reflective decision-making, in a very real sense critical thinking is **pervasive**.* There is hardly a time or a place where it would not seem to be of potential value. As long as people have purposes in mind and wish to judge how to accomplish them, as long as people wonder what is true and what is not, what to believe and what to reject, strong critical thinking is going to be necessary.

And yet weird things happen, so it is probably true that some people might let their thinking skills grow dull. It is easier to imagine times when people are just too tired, too lax, or too frightened. But imagine it you



can, Young Skywalker, so there has to be more to critical thinking than just the list of cognitive skills. Human beings are more than thinking machines. And this brings us back to those all-important attitudes which the experts called “dispositions.”

The experts were persuaded that critical thinking is a pervasive and purposeful human phenomenon. The ideal critical thinker can be characterized not merely by her or his cognitive skills but also by how she or he approaches life and living in general. This is a bold claim. Critical thinking goes way beyond the classroom. In fact, many of the experts fear that some of the things people experience in school are actually harmful to the development and cultivation of strong critical thinking. Critical thinking came before schooling was ever invented, it lies at the very roots of civilization. It is a corner stone in the journey human kind is taking from beastly savagery to global sensitivity. Consider what life would be like without the things on this list and we think you will understand.

The approaches to life and living which characterize critical thinking include:

- * inquisitiveness with regard to a wide range of issues,
- * concern to become and remain well-informed,
- * alertness to opportunities to use critical thinking,
- * trust in the processes of reasoned inquiry,
- * self-confidence in one’s own abilities to reason,
- * open-mindedness regarding divergent world views,
- * flexibility in considering alternatives and opinions
- * understanding of the opinions of other people,
- * fair-mindedness in appraising reasoning,
- * honesty in facing one’s own biases, prejudices, stereotypes, or egocentric tendencies,

- * prudence in suspending, making or altering judgments,
- * willingness to reconsider and revise views where honest reflection suggests that change is warranted.

What would someone be like who lacked those dispositions?

It might be someone who does not care about much of anything, is not interested in the facts, prefers not to think, mistrusts reasoning as a way of finding things out or solving problems, holds his or her own reasoning abilities in low esteem, is close-minded, inflexible, insensitive, cannot understand what others think, is unfair when it comes to judging the quality of arguments, denies his or her own biases, jumps to conclusions or delays too long in making judgments, and never is willing to reconsider an opinion. Not someone prudent people would want to ask to manage their investments!

The experts went beyond approaches to life and living in general to emphasize that strong critical thinkers can also be described in terms of how they approach specific issues, questions, or problems. The experts said you would find these sorts of characteristics:

- * clarity in stating the question or concern,
- * orderliness in working with complexity,
- * diligence in seeking relevant information,
- * reasonableness in selecting and applying criteria,
- * care in focusing attention on the concern at hand,
- * persistence though difficulties are encountered,
- * precision to the degree permitted by the subject and the circumstances.

So, how would a weak critical thinker approach specific problems or issues? Obviously, by being muddle-headed about what he or she is doing, disorganized and overly simplistic, spotty about getting the facts, apt to apply unreasonable criteria, easily distracted, ready to give up at the least hint of difficulty, intent on a solution that is more detailed than is possible, or being

satisfied with an overly generalized and uselessly vague response. Remind you of anyone you know?

Someone positively disposed toward using critical thinking would probably agree with statements like these:

- "I hate talk shows where people shout their opinions but never give any reasons at all."
- "Figuring out what people really mean by what they say is important to me."
- "I always do better in jobs where I'm expected to think things out for myself."
- "I hold off making decisions until I have thought through my options."
- "Rather than relying on someone else's notes, I prefer to read the material myself."
- "I try to see the merit in another's opinion, even if I reject it later."
- "Even if a problem is tougher than I expected, I will keep working on it."
- "Making intelligent decisions is more important than winning arguments."

- "I don't waste time looking things up."
- "I hate when teachers discuss problems instead of just giving the answers."
- "If my belief is truly sincere, evidence to the contrary is irrelevant."
- "Selling an idea is like selling cars, you say whatever works."

We used the expression "strong critical thinker" to contrast with the expression "weak critical thinker." But you will find people who drop the adjective "strong" (or "good") and just say that someone is a "critical thinker" or not. It is like saying that a soccer (European "football") player is a "defender" or "not a defender", instead of saying the player's skills at playing defense are strong or weak. People use the word "defender" in place of the phrase "is good at playing defense." Similarly, people use "critical thinker" in place of "is a strong critical thinker" or "has strong critical thinking



A person **disposed to be averse or hostile toward using critical thinking** would probably disagree with the statements above but be likely to agree with these:

- "I prefer jobs where the supervisor says exactly what to do and exactly how to do it."
- "No matter how complex the problem, you can bet there will be a simple solution."

skills." This is not only a helpful conversational shortcut, it suggests that to many people "critical thinker" has a **laudatory** sense. The word can be used to praise someone at the same time that it identifies the person, as in "Look at that play. That's what I call a defender!"

“If we were compelled to make a choice between these personal attributes and knowledge about the principles of logical reasoning together with some degree of technical skill in manipulating special logical processes, we should decide for the former.”

John Dewey, *How We Think*, 1909. Republished as *How We Think: A Restatement of the Relation of Reflective Thinking to the Educational Process*. D. C. Heath Publishing. Lexington, MA. 1933.

We said the experts did not come to full agreement on something. That thing has to do with the concept of a “strong critical thinker.” This time the emphasis is on the word “good” because of a crucial ambiguity it contains. A person can be good at critical thinking, meaning that the person can have the appropriate dispositions and be adept at

the cognitive processes, while still not being a good (in the moral sense) critical thinker. For example, a person can be adept at developing arguments and then, unethically, use this skill to mislead and exploit a gullible person, perpetrate a fraud, or deliberately confuse and confound, and frustrate a project.

The experts were faced with an interesting problem. Some, a minority, would prefer to think that critical thinking, by its very nature, is inconsistent with the kinds of unethical and deliberately counterproductive examples given. They find it hard to imagine a person who was good at critical thinking not also being good in the broader personal and social sense. In other words, if a person were “really” a “strong critical thinker” in the procedural sense and if the person had all the appropriate dispositions, then the person simply would not do those kinds of exploitive and aggravating things.

Critical Thinking Mindset Self-Rating Form

Answer yes or no to each. Can I **name any specific instances over the past two days** when I:

- 1** was courageous enough to ask tough questions about some of my longest held and most cherished beliefs?
- 2** backed away from questions that might undercut some of my longest held and most cherished beliefs?
- 3** showed tolerance toward the beliefs, ideas, or opinions of someone with whom I disagreed?
- 4** tried to find information to build up my side of an argument but not the other side?
- 5** tried to think ahead and anticipate the consequences of various options?
- 6** laughed at what other people said and made fun of their beliefs, values, opinion, or points of views?
- 7** made a serious effort to be analytical about the foreseeable outcomes of my decisions?
- 8** manipulated information to suit my own purposes?
- 9** encouraged peers not to dismiss out of hand the opinions and ideas other people offered?
- 10** acted with disregard for the possible adverse consequences of my choices?
- 11** organized for myself a thoughtfully systematic approach to a question or issue?
- 12** jumped in and tried to solve a problem without first thinking about how to approach it?
- 13** approached a challenging problem with confidence that I could think it through?
- 14** instead of working through a question for myself, took the easy way out and asked someone else for the answer?
- 15** read a report, newspaper, or book chapter or watched the world news or a documentary just to learn something new?
- 16** put zero effort into learning something new until I saw the immediate utility in doing so?
- 17** showed how strong I was by being willing to honestly reconsider a decision?
- 18** showed how strong I was by refusing to change my mind?
- 19** attended to variations in circumstances, contexts, and situations in coming to a decision?
- 20** refused to reconsider my position on an issue in light of differences in context, situations, or circumstances?

If you have described yourself honestly, this self-rating form can offer a rough estimate of what you think your overall disposition toward critical thinking has been in the past two days.

Give yourself 5 points for every “Yes” on odd numbered items and for every “No” on even numbered items. If your total is 70 or above, you are rating your disposition toward critical thinking over the past two days as generally positive. Scores of 50 or lower indicate a self-rating that is averse or hostile toward critical thinking over the past two days. Scores between 50 and 70 show that you would rate yourself as displaying an ambivalent or mixed overall disposition toward critical thinking over the past two days.

Interpret results on this tool cautiously. At best this tool offers only a rough approximation with regard to a brief moment in time. Other tools are more refined, such as the *California Critical Thinking Disposition Inventory*, which gives results for each of the seven critical thinking habits of mind.

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For a fuller and more robust measure of critical thinking dispositions see the [California Critical Thinking Disposition Inventory \(CCTDI\)](#) by Facione and Facione, published in 1992, by Insight Assessment.

The large majority, however, hold the opposite judgment. They are firm in the view that strong critical thinking has nothing to do with any given set of cultural beliefs, religious tenets, ethical values, social mores, political orientations, or orthodoxies of any kind. Rather, the commitment one makes as a strong critical thinker is to always seek the truth with objectivity, integrity, and fair-mindedness. The majority of experts maintain that critical thinking conceived of as we have described it above, is, regrettably, not inconsistent with abusing one's knowledge, skills, or power. There have been people with superior thinking skills and strong habits of mind who, unfortunately, have used their talents for ruthless, horrific, and immoral purposes. Would that it were not so! Would that experience, knowledge, mental horsepower, and ethical virtue were all one and the same. But from the time of Socrates, if not thousands of years before that, humans have known that many of us have one or more of these without having the full set.

Any tool, any approach to situations, can go either way, ethically speaking, depending on the character, integrity, and principles of the persons who possess them. So, in the final analysis the majority of experts maintained that we cannot say a person is not thinking critically simply because we disapprove ethically of what the person is doing. The majority concluded that, "what 'critical thinking' means, why it is of value, and the ethics of its use are best regarded as three distinct concerns."

Perhaps this realization forms part of the basis for why people these days are demanding a broader range of learning outcomes from our schools and colleges. "Knowledge and skills," the staples of the educational philosophy of the mid-twentieth century, are not sufficient. We must look to a broader set of outcomes including habits of mind and dispositions, such as civic engagement, concern for the common good, and social responsibility.

"Thinking" in Popular Culture

We have said so many good things about *critical thinking* that you might have the impression that "critical thinking" and "good thinking" mean the same thing. But that is not what the experts said. They see critical thinking as making up part of what we mean by good thinking, but not as being the only kind of good thinking. For example, they would have included creative thinking as part of good thinking.

Creative or innovative thinking is the kind of thinking that leads to new insights, novel approaches, fresh perspectives, whole new ways of understanding and conceiving of things. The products of creative thought include some obvious things like music, poetry, dance, dramatic literature, inventions, and technical innovations. But there are some not so obvious examples as well, such as ways of putting a question that expand the horizons of possible solutions, or ways of conceiving of relationships which challenge presuppositions and lead one to see the world in imaginative and different ways.

The experts working on the concept of critical thinking wisely left open the entire question of what the other forms good thinking might take. Creative thinking is only one example. There is a kind of *purposive, kinetic thinking* that instantly coordinates movement and intention as, for example, when an athlete dribbles a soccer ball down the field during a match. There is a kind of *meditative thinking* which may lead to a sense of inner peace or to profound insights about human existence. In contrast, there is a kind of *hyper-alert, instinctive thinking* needed by soldiers in battle. In the context of popular culture one finds people proposing all kinds of thinking or this-kind of intelligence or that-kind of intelligence. Some times it is hard to sort out the science from the pseudo-science – the kernel of enduring truth from the latest cocktail party banter.

Two Parallel-Functioning, Rational, Decision Making Systems

SYSTEM 1

Renders quick, holistic associational, judgments.

Automatic, well-trained, reactive.

Can block out or derive support from system 2.



SYSTEM 2

Renders considered, criterion-based, judgments.

Reflective, reasoned, systematic.

Can bolster or over-ride system 1.

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“Thinking” in Cognitive Science

Theories emerging from more scientific studies of human thinking and decision-making in recent years propose that thinking is more integrated and less dualistic than the notions in popular culture suggest. We should be cautious about proposals suggesting oversimplified ways of understanding how humans think. We should avoid harsh, rigid dichotomies such as “reason vs. emotion,” “intuitive vs. linear,” “creativity vs. criticality,” “right brained vs. left brained,” “as on Mars vs. as on Venus.”

There is often a kernel of wisdom in popular beliefs, and perhaps that gem this time is the realization that some times we decide things very quickly almost as spontaneous, intuitive, reactions to the situation at hand. Many accidents on the freeways of this nation are avoided precisely

because drivers are able to see and react to dangerous situations so quickly. Many good decisions which feel intuitive are really the fruit of expertise. Decisions good drivers make in those moments of crisis, just like the decisions which practiced athletes make in the flow of a game or the decisions that a gifted teacher makes as she or he interacts with students, are borne of expertise, training, and practice.

At the same time that we are immersed in the world around us and in our daily lives, constantly making decisions unreflectively, we may also be thinking quite reflectively about something. Perhaps we’re worried about a decision which we have to make about an important project at work, or about a personal relationship, or about a legal matter, whatever. We gather information, consider our options, explore possibilities, formulate some thoughts about

what we propose to do and why this choice is the right one. In other words, we make a purposeful, reflective judgment about what to believe or what to do – precisely the kind of judgment which is the focus of critical thinking.

Recent integrative models of human decision-making propose that the thinking processes of our species is not best described as a conflictive duality as in “intuitive vs. reflective” but rather an integrative functioning of two mutually supportive systems “intuitive and reflective.” These two systems of thinking are present in all of us and can act in parallel to process cognitively the matters over which we are deciding.

One system is more intuitive, reactive, quick and holistic. So as not to confuse things with the notions of thinking in popular culture, cognitive scientists often name this system, “System 1.” The other (yes, you can guess its name) is more deliberative, reflective, computational and rule governed. You are right, it is called “System 2.”

In **System 1** thinking, one relies heavily on a number of heuristics (cognitive maneuvers), key situational characteristics, readily associated ideas, and vivid memories to arrive quickly and confidently at a judgment. System 1 thinking is particularly helpful in familiar situations when time is short and immediate action is required.

While System 1 is functioning, another powerful system is also at work, that is, unless we shut it down by abusing alcohol or drugs, or with fear or indifference. Called “**System 2**,” this is our more reflective thinking system. It is useful for making judgments when you find yourself in

unfamiliar situations and have more time to figure things out. It allows us to process abstract concepts, to deliberate, to plan ahead, to consider options carefully, to review and revise our work in the light of relevant guidelines or standards or rules of procedure. While System 2 decisions are also influenced by the correct or incorrect application of heuristic maneuvers, this is the system which relies on well articulated reasons and more fully developed evidence. It is reasoning based on what we have learned through careful analysis, evaluation, explanation, and self-correction. This is the system which values intellectual honesty, analytically anticipating what happens next, maturity of judgment, fair-mindedness, elimination of biases, and truth-seeking. This is the system which we rely on to think carefully through complex, novel, high-stakes, and highly integrative problems.⁵

Educators urge us to improve our critical thinking skills and to reinforce our disposition to use those skills because that is perhaps the best way to develop and refine our System 2 reasoning.

System 1 and System 2 are both believed to be vital decision-making tools when stakes are high and when uncertainty is an issue. Each of these two cognitive systems are believed to be capable of functioning to monitor and potentially override the other. This is one of the ways our species reduces the chance of making foolish, sub-optimal or even dangerous errors in judgment. Human thinking is far from perfect. Even a good thinker makes both System 1 and 2 errors. At times we misinterpret things, or we get our facts wrong, and we make mistakes as a result. But often our errors are directly related to the influences and misapplications of *cognitive heuristics*. Because we share the propensity

⁵ Chapters 10 and 11 of *Think Critically*, Pearson Education, locate critical thinking within this integrative model of thinking. The cognitive heuristics, which will be described next, and the human capacity to derive sustained confidence decisions (right or wrong), - known as “dominance structuring,” – are presented there too. There are lots of useful exercises and examples in that book. You

may also wish to consult the references listed at the end of this essay. The material presented in this section is derived from these books and related publications by many of these same authors and others working to scientifically explain how humans actually make decisions.

to use these heuristics as we make decisions, let's examine how some of them influence us.

Thomas Jefferson



"Fix reason firmly in her seat, and call to her tribunal every fact, every opinion. Question with boldness even the existence of a God; because, if there be one, he must more approve of the homage of reason, than that of blindfolded fear."

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Cognitive heuristics are thinking maneuvers which, at times, appear to be almost hardwired into our species. They influence both systems of thinking, the intuitive thinking of System 1 and the reflective reasoning of System 2. Five heuristics often seem to be more frequently operating in our System 1 reasoning are known as *availability, affect, association, simulation, and similarity*.

Availability, the coming to mind of a story or vivid memory of something that happened to you or to someone close to you, inclines a person make inaccurate estimates of the likelihood of that thing's happening again. People tell stories of things that happened to themselves or their friends all the time as a way of explaining their own decisions. The stories may not be scientifically representative, the events may be mistaken, misunderstood, or misinterpreted. But all that aside, the power of the story is to guide, often in a good way, the decision toward one choice rather than another.

The **Affect** heuristic operates when you have an immediate positive or an negative reaction to some idea, proposal, person, object, whatever. Sometimes called a "gut reaction" this affective response sets

up an initial orientation in us, positive or negative, toward the object. It takes a lot of System 2 reasoning to overcome a powerful affective response to an idea, but it can be done. And at times it should be, because there is no guarantee that your gut reaction is always right.

The **Association** heuristic is operating when one word or idea reminds us of something else. For example, some people associate the word "cancer" with "death." Some associate "sunshine" with "happiness." These kinds of associational reasoning responses can be helpful at times, as for example if associating cancer with death leads you not to smoke and to go in for regular checkups. At other times the same association may influence a person to make an unwise decision, as for example if associating "cancer" with "death" were to lead you to be so fearful and pessimistic that you do not seek diagnosis and treatment of a worrisome cancer symptom until it was really too late to do anything.

The **Simulation** heuristic is working when you are imagining how various scenarios will unfold. People often imagine how a conversation will go, or how they will be treated by someone else when they meet the person, or what their friends or boss or lover will say and do when they have to address some difficult issue. These simulations, like movies in our heads, help us prepare and do a better job when the difficult moment arrives. But they can also lead us to have mistaken expectations. People may not respond as we imagined, things may go much differently. Our preparations may fail us because the ease of our simulation misled us into thinking that things would have to go as we had imagined them. And they did not.

CRITICAL THINKING SKILLS MAP ON TO LEADERSHIP DECISION MAKING

Successful professionals with leadership responsibilities, like those in business or the military, apply all their critical thinking skills to solve problems and to make sound decisions. At the risk of oversimplifying all the ways that our critical thinking intersects with problem solving and leadership decision making, here are some of the more obvious connecting points:

- **Identify Critical Elements**
 - **Analyze** the strategic environment, identify its elements and their relationships
 - **Interpret** events and other elements in the strategic environment for signs of risk, opportunity, weakness, advantage
- **Project Logical Consequences**
 - **Infer**, given what is known with precision and accuracy within the strategic environment, the logical and most predictable consequences of various courses of action
- **Navigate Risk and Uncertainty**
 - **Infer**, given the range of uncertainty and risk in the strategic environment, the full range of the possible and probable consequences of each possible course of action
- **Assess Decision Options**
 - **Evaluate** anticipated results for positive and negative impacts
 - **Evaluate** risks, opportunities, options, consequences
 - **Explain** the rationale (evidence, methodology, criteria, theoretical assumptions, and context) for deciding on the integrated strategic objectives and for the planning and action parameters that compose the strategy
 - **Double Check Everything:** At every step **review one's own thinking** and make necessary corrections.

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The **Similarity** heuristic operates when we notice some way in which we are like someone else and infer that what happened to that person is therefore more likely to happen to us. The similarity heuristic functions much like an analogical argument or metaphorical model. The similarity we focus on might be fundamental and relevant, which would make the inference more warranted. For example, the boss fired your coworker for missing sales targets and you draw the reasonable conclusion that if you miss your sales targets you'll be fired too. Or the similarity that comes to mind might be superficial or not connected with the outcome, which would make the inference unwarranted. For example you see a TV

commercial showing trim-figured young people enjoying fattening fast foods and infer that because you're young too you can indulge your cravings for fast foods without gaining a lot of excess unsightly poundage.

Heuristics and biases often appearing to be somewhat more associated with System 2 thinking include: *satisficing, risk/loss aversion, anchoring with adjustment, and the illusion of control.*

Satisficing occurs as we consider our alternatives. When we come to one which is good enough to fulfill our objectives we often regard ourselves as having completed our deliberations. We have satisfied. And why not? The choice is, after

all, good enough. It may not be perfect, it may not be optimal, it may not even be the best among the options available. But it is good enough. Time to decide and move forward.

The running mate of satisficing is temporizing. Temporizing is deciding that the option which we have come to is “good enough for now.” We often move through life satisficing and temporizing. At times we look back on our situations and wonder why it is that we have settled for far less than we might have. If we had only studied harder, worked out a little more, taken better care of ourselves and our relationships, perhaps we would not be living as we are now. But, at the time each of the decisions along the way was “good enough for the time being.”

We are by nature a species that is **averse to risk and loss**. Often we make decisions on the basis of what we are too worried about losing, rather than on the basis of what we might gain. This works out to be a rather serviceable approach in many circumstances. People do not want to lose control, they do not want to lose their freedom, they do not want to lose their lives, their families, their jobs, their possessions. High stakes gambling is best left to those who can afford to lose the money. Las Vegas didn't build all those multi-million dollar casino hotels because vacationers are winning all the time! And so, in real life, we take precautions. We avoid unnecessary risks. The odds may not be stacked against us, but the consequences of losing at times are so great that we would prefer to forego the possibilities of gain in order not to lose what we have. And yet, on occasion this can be a most unfortunate decision too. History has shown time and time again that businesses which avoid risks often are unable to compete successfully with those willing to move more boldly into new markets or into new product lines.

Any heuristic is only a maneuver, perhaps a shortcut or impulse to think or act in one way rather than another, but certainly

not a failsafe rule. It may work out well much of the time to rely on the heuristic, but it will not work out for the best all of the time.

For example, people with something to lose tend toward conservative choices politically as well as economically. Nothing wrong with that necessarily. Just an observation about the influence of Loss Aversion heuristic on actual decision making. We are more apt to endure the status quo, even as it slowly deteriorates, than we are to call for “radical” change. Regrettably, however, when the call for change comes, it often requires a far greater upheaval to make the necessary transformations, or, on occasion, the situation has deteriorated beyond the point of no return. In those situations we find ourselves wondering why we waited so long before doing something.

The heuristic known as **Anchoring with Adjustment** is operative when we find ourselves making evaluative judgments. The natural thing for us to do is to locate or anchor our evaluation at some point along whatever scale we are using. For example, a professor says that the student's paper is a C+. Then, as other information comes our way, we may adjust that judgment. The professor, for example, may decide that the paper is as good as some others that were given a B-, and so adjust the grade upward. The interesting thing about this heuristic, is that we do not normally start over with a fresh evaluation. We have dropped anchor and we may drag it upward or downward a bit, but we do not pull it off the bottom of the sea to relocate our evaluation. First impressions, as the saying goes, cannot be undone. The good thing about this heuristic is that it permits us to move on. We have done the evaluation; there are other papers to grade, other projects to do, other things in life that need attention. We could not long endure if we had to constantly re-evaluate every thing anew. The unfortunate thing about this heuristic is that we sometimes drop anchor in the wrong place; we have a hard time giving people a second chance at making a good first impression.

The heuristic known as **Illusion of Control** is evident in many situations. Many of us over-estimate our abilities to control what will happen. We make plans for how we are going to do this or that, say this or that, manipulate the situation this way or that way, share or not share this information or that possibility, all the time thinking that somehow our petty plans will enable us to control what happens. We act as if others are dancing on the ends of the strings that we are pulling, when in actuality the influences our words or actions have on future events may be quite negligible. At times we do have some measure of control. For example we may exercise, not smoke, and watch our diet in order to be more fit and healthy. We are careful not to drink if we are planning to drive so that we reduce the risks of being involved in a traffic accident. But at times we simply are mistaken about our ability to actually exercise full control over a situation. Sadly we might become ill even if we do work hard to take good care of ourselves. Or we may be involved in an accident even if we are sober. Our business may fail even if we work very hard to make it a success. We may not do as well on an exam as we might hope even if we study hard.

Related to the Illusion of Control heuristic is the tendency to misconstrue our personal influence or responsibility for past events. This is called **Hindsight Bias**. We may over-estimate the influence our actions have had on events when things go right, or we may underestimate our responsibility or culpability when things go wrong. We have all heard people bragging about how they did this and how they did that and, as a result, such and such wonderful things happened. We made these great plans and look how well our business did financially. Which may be true when the economy is strong; but not when the economy is failing. It is not clear how much of that success came from the planning and how much came from the general business environment. Or, we have all been in the room when it was time to own up for some thing that went wrong and thought to ourselves, hey, I may have had

some part in this, but it was not entirely my fault. "It wasn't my fault the children were late for school, hey I was dressed and ready to go at the regular time." As if seeing that the family was running late I had no responsibility to take some initiative and help out.

"Insanity is doing the same thing over and over again while expecting a different outcome."

Albert Einstein

Research on our shared heuristic patterns of decision-making does not aim to evaluate these patterns as necessarily good or bad patterns of thinking. I fear that my wording of them above may not have been as entirely neutral and descriptive as perhaps it should have been. In truth, reliance on heuristics can be an efficient way of deciding things, given how very complicated our lives are. We cannot devote maximal cognitive resources to every single decision we make.

Those of us who study these heuristic thinking phenomena are simply trying to document how we humans *do* think. There are many useful purposes for doing this. For example, if we find that people repeatedly make a given kind of mistake when thinking about a commonly experienced problem, then we might find ways to intervene and to help ourselves not repeat that error over and over again.

This research on the actual patterns of thinking used by individuals and by groups might prove particularly valuable to those who seek interventions which could improve how we make our own health care decisions, how we make business decisions, how we lead teams of people to work more effectively in collaborative settings, and the like.

Popular culture offers one other myth about decision-making which is worth questioning. And that is the belief that when we make reflective decisions we carefully weigh each of our options, giving due consideration to all of them in turn, before deciding which we will adopt. Although perhaps it should be, research on human decision-making shows that this simply is not what happens.⁶ When seeking to explain how people decide on an option with such conviction that they stick to their decision over time and with such confidence that they act on that decision, the concept that what we do is build a **Dominance Structure** has been put forth. In a nutshell this theory suggests that when we settle on a particular option which is good enough we tend to elevate its merits and diminish its flaws relative to the other options. We raise it up in our minds until it becomes for us the dominant option. In this way, as our decision takes shape, we gain confidence in our choice and we feel justified in dismissing the other options, even though the objective distance between any of them and our dominant option may not be very great at all. But we become invested in our dominant option to the extent that we are able to put the other possibilities aside and act on the basis of our choice. In fact, it comes to dominate the other options in our minds so much that we are able to sustain our decision to act over a period of time, rather than going back to re-evaluate or reconsider constantly. Understanding the natural phenomenon of dominance structuring can help us appreciate why it can be so difficult for us to get others to change their minds, or why it seems that our reasons for our decisions are so much better than any of the objections which others might make to our decisions. This is not to say that we are right or wrong. Rather, this is only to observe that human beings are capable of unconsciously building up defenses around their choices which can result in the warranted or unwarranted

confidence to act on the basis of those choices.

Realizing the power of dominance structuring, one can only be more committed to the importance of education and critical thinking. We should do all that we can to inform ourselves fully and to reflect carefully on our choices before we make them, because we are, after all, human and we are as likely as the next person to believe that we are right and they are wrong once the dominance structure begins to be erected. Breaking through that to fix bad decisions, which is possible, can be much harder than getting things right in the first place.

There are more heuristics than only those mentioned above. There is more to learn about dominance structuring as it occurs in groups as well as in individuals, and how to mitigate the problems which may arise by prematurely settling on a “good enough” option, or about how to craft educational programs or interventions which help people be more effective in their System 1 and System 2 thinking. There is much to learn about human thinking and how to optimize it in individuals of different ages; how to optimize the thinking of groups of peers and groups where organizational hierarchies influence interpersonal dynamics. And, happily, there is a lot we know today about human thinking and decision-making that we did not know a few years ago.

Why critical thinking?

Let us start with you first. Why would critical thinking be of value to you to have the cognitive skills of interpretation, analysis, evaluation, inference, explanation, and self-regulation?

Apart from, or maybe in light of, what we said at the beginning of this essay about

⁶ Henry Montgomery, “From cognition to action: The search for dominance in decision making.” In *Process and Structure in Human Decision-Making*, Montgomery H, Svenson O (Eds). John Wiley &

Sons: Chichester, UK, 1989. For a more accessible description along with reflective exercises on how to avoid becoming “locked in” to a poor decision prematurely, see chapter 11 of *Think Critically*.

the utility of positive critical thinking and about the problems that failures of critical thinking contribute to, why would it be of value to you to learn to approach life and to approach specific concerns with the critical thinking dispositions listed above? Would you have greater success in your work? Would you get better grades?

Actually the answer to the grades question, scientifically speaking, is very possibly, Yes! A study of over 1100 college students shows that scores on a college level critical thinking skills test significantly correlated with college GPA.⁷ It has also been shown that critical thinking skills can be learned, which suggests that as one learns them one's GPA might well improve. In further support of this hypothesis is the significant correlation between critical thinking and reading comprehension. Improvements in the one are paralleled by improvements in the other. Now if you can read better and think better, might you not do better in your classes, learn more, and get better grades. It is, to say the least, very plausible.

Learning, Critical Thinking, and Our Nation's Future

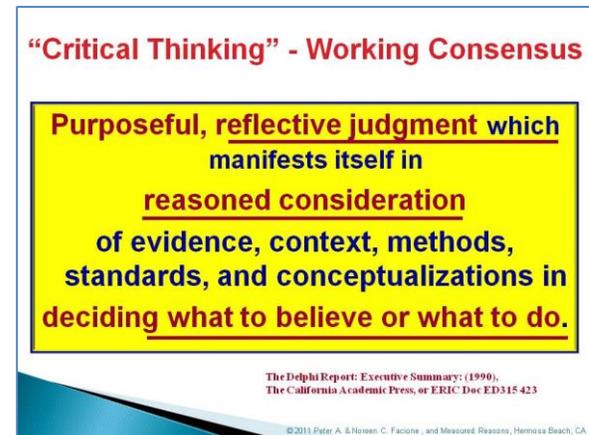
"The future now belongs to societies that organize themselves for learning... nations that want high incomes and full employment must develop policies that emphasize the acquisition of knowledge and skills by everyone, not just a select few."

Ray Marshall & Marc Tucker, *Thinking For A Living: Education And The Wealth of Nations*, Basic Books. New York. 1992.

But what a limited benefit — better grades. Who really cares in the long run? Two years after college, five years out, what does GPA really mean? Right now college

⁷ Findings regarding the effectiveness of critical thinking instruction, and correlations with GPA and reading ability are reported in "Technical Report #1, Experimental Validation and Content Validity" (ERIC ED 327 549), "Technical Report #2, Factors Predictive of CT Skills" (ERIC ED 327 550), and "Gender, Ethnicity,

level technical and professional programs have a half-life of about four years, which means that the technical content is expanding so fast and changing so much that in about four years after graduation your professional training will be in serious need of renewal. So, if the only thing a college is good for is to get the entry level training and the credential needed for some job, then college would be a time-limited value.



The APA Delphi Report,
[Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction](#)
1990 ERIC Doc. NO.: ED 315 423

Is that the whole story? A job is a good thing, but is that what a college education is all about, getting started in a good job? Maybe some cannot see its further value, but many do. A main purpose, if not *the* main purpose, of the collegiate experience, at either the two-year or the four-year level, is to achieve what people have called a "liberal education." Not liberal in the sense of a smattering of this and that for no particular purpose except to fulfill the unit requirement. But liberal in the sense of "liberating." And who is being liberated? You! Liberated from a kind of slavery. But from whom?

Major, CT Self-Esteem, and the California Critical Thinking Skills Test" (ERIC ED 326 584). These findings remain consistent in research using the tools in the [California Critical Thinking Skills Test family](#) of instruments published by Insight Assessment.

From professors. Actually from dependence on professors so that they no longer stand as infallible authorities delivering opinions beyond our capacity to challenge, question, and dissent. In fact, this is exactly what the professors want. They want their students to excel on their own, to go beyond what is currently known, to make their own contributions to knowledge and to society. [Being a professor is a curious job — the more effective you are as a teacher, less your students require your aid in learning.]

Liberal education is about learning to learn, which means learning to think for yourself on your own and in collaboration with others.

Liberal education leads us away from naive acceptance of authority, above self-defeating relativism, and beyond ambiguous contextualism. It culminates in principled reflective judgment. Learning critical thinking, cultivating the critical spirit, is not just a means to this end, it is part of the goal itself. People who are weak critical thinkers, who lack the dispositions and skills described, cannot be said to be liberally educated, regardless of the academic degrees they may hold.

Yes, there is much more to a liberal education, than critical thinking. There is an understanding of the methods, principles, theories and ways of achieving knowledge which are proper to the different intellectual realms. There is an encounter with the cultural, artistic and spiritual dimensions of life. There is the evolution of one's decision making to the level of principled integrity and concern for the common good and social justice. There is the realization of the ways all our lives are shaped by global as well as local political, social, psychological, economic, environmental, and physical forces. There is the growth that comes from the interaction with cultures, languages, ethnic groups, religions, nationalities, and social classes other than one's own. There is the refinement of one's humane

sensibilities through reflection on the recurring questions of human existence, meaning, love, life and death. There is the sensitivity, appreciation and critical appraisal of all that is good and all that is bad in the human condition. As the mind awakens and matures, and the proper nurturing and educational nourishment is provided, these others central parts of a liberal education develop as well. Critical thinking plays an essential role in achieving these purposes.

Any thing else? What about going beyond the individual to the community?

The experts say critical thinking is fundamental to, if not essential for, "a rational and democratic society." What might the experts mean by this?

Well, how wise would democracy be if people abandoned critical thinking? Imagine an electorate that cared not for the facts, that did not wish to consider the pros and cons of the issues, or if they did, had not the brain power to do so. Imagine your life and the lives of your friends and family placed in the hands of juries and judges who let their biases and stereotypes govern their decisions, who do not attend to the evidence, who are not interested in reasoned inquiry, who do not know how to draw an inference or evaluate one. Without critical thinking people would be more easily exploited not only politically but economically. The impact of abandoning critical thinking would not be confined to the micro-economics of the household checking account. Suppose the people involved in international commerce were lacking in critical thinking skills, they would be unable to analyze and interpret the market trends, evaluate the implications of interest fluctuations, or explain the potential impact of those factors which influence large scale production and distribution of goods and materials. Suppose these people were unable to draw the proper inferences from the economic facts, or unable to properly evaluate the claims made by the unscrupulous and misinformed. In such a situation serious economic mistakes would

be made. Whole sectors of the economy would become unpredictable and large scale economic disaster would become extremely likely. So, given a society that does not value and cultivate critical thinking, we might reasonably expect that in time the judicial system and the economic system would collapse. And, in such a society, one that does not liberate its citizens by teaching them to think critically for themselves, it would be madness to advocate democratic forms of government.

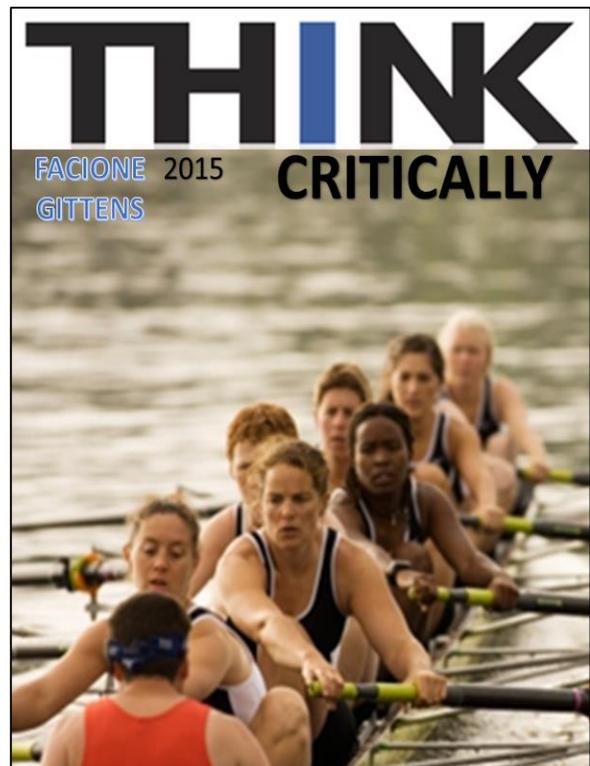
Critical thinking is skeptical without being cynical. It is open-minded without being wishy-washy. It is analytical without being nitpicky. Critical thinking can be decisive without being stubborn, evaluative without being judgmental, and forceful without being opinionated.

Is it any wonder that business and civic leaders are maybe even more interested in critical thinking than educators? Critical thinking employed by an informed citizenry is a necessary condition for the success of democratic institutions and for competitive free-market economic enterprise. These values are so important that it is in the national interest that we should try to educate all citizens so that they can learn to think critically. Not just for their personal good, but for the good of the rest of us too.

Generalizing, imagine a society, say, for example, the millions of people living in the Los Angeles basin, or in New York and along the east coast, or in Chicago, or Mexico City, Cairo, Rome, Tokyo, Baghdad, Moscow, Beijing, or Hong Kong. They are, de facto, entirely dependent upon one another, and on hundreds of thousands of other people as well for their external supplies of food and water, for their survival. Now imagine that these millions permitted

their schools and colleges to stop teaching people how to think critically and effectively. Imagine that because of war, or AIDS, or famine, or religious conviction, parents could not or would not teach their children how to think critically. Imagine the social and political strife, the falling apart of fundamental systems of public safety and public health, the loss of any scientific understanding of disease control or agricultural productivity, the emergence of paramilitary gangs, strong men, and petty warlords seeking to protect themselves and their own by acquiring control over what food and resources they can and destroying those who stand in their path.

Look at what has happened around the world in places devastated by economic embargoes, one-sided warfare, or the HIV/AIDS epidemic. Or, consider the problem of global climate change, and how important it is for all of us to cooperate with efforts to curtail our uses of fossil fuels in order to reduce emissions of harmful greenhouse gases.



Consider the “cultural revolutions” undertaken by totalitarian rulers. Notice how in virtually every case absolutist and dictatorial despots seek ever more severe limitations on free expression. They label “liberal” intellectuals “dangers to society” and expel “radical” professors from teaching posts because they might “corrupt the youth.” Some use the power of their governmental or religious authority to crush not only their opposition but the moderates as well -- all in the name of maintaining the purity of their movement. They intimidate journalists and those media outlets which dare to comment “negatively” on their political and cultural goals or their heavy handed methods.

The historical evidence is there for us to see what happens when schools are closed or converted from places of education to places for indoctrination. We know what happens when children are no longer being taught truth-seeking, the skills of good reasoning, or the lessons of human history and basic science: Cultures disintegrate; communities collapse; the machinery of civilization fails; massive numbers of people die; and sooner or later social and political chaos ensues.

Or, imagine a media, a religious or political hegemony which cultivated, instead of critical thinking, all the opposite dispositions? Or consider if that hegemony reinforced uncritical, impulsive decision making and the “ready-shoot-aim” approach to executive action. Imagine governmental structures, administrators, and community leaders who, instead of encouraging critical thinking, were content to make knowingly irrational, illogical, prejudicial, unreflective, short-sighted, and unreasonable decisions.

How long might it take for the people in this society which does not value critical thinking to be at serious risk of foolishly harming themselves and each other?

The news too often reports about hate groups, wanton shooting, terrorists and

violently extreme religious zealots. Education which includes a good measure of critical thinking skills and dispositions like truth-seeking and open-mindedness, is a problem for terrorists and extremists of every stripe because terrorists and extremists want to control of what people think. They are ideologists of the worst kind. Their methods include indoctrination, intimidation, and the strictest authoritarian orthodoxy. In the “black-and-white” world of “us vs. them” a good education would mean that the people might begin to think for themselves. And that is something these extremists do not want.

History shows that assaults on learning, whether by book burning, exile of intellectuals, or regulations aimed at suppressing research and frustrating the fair-minded, evidence-based, and unfettered pursuit of knowledge, can happen wherever and whenever people are not vigilant defenders of open, objective, and independent inquiry.

Does this mean that society should place a very high value on critical thinking?

Absolutely!

Does this mean society has the right to force someone to learn to think critically?

Maybe. But, really, should we have to?

IDEAS

A 5-Step Critical Thinking General Problem Solving Process

I = IDENTIFY the Problem and Set Priorities (Step 1)

D = DETERMINE Relevant Information and Deepen Understanding (Step 2)

E = ENUMERATE Options and Anticipate Consequence (Step 3)

A = ASSESS the Situation and Make a Preliminary Decision (Step 4)

S = SCRUTINIZE the Process and Self-Correct as Needed (Step 5)

EXPERT CONSENSUS STATEMENT REGARDING CRITICAL THINKING AND THE IDEAL CRITICAL THINKER

“We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one’s personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating strong critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society.”

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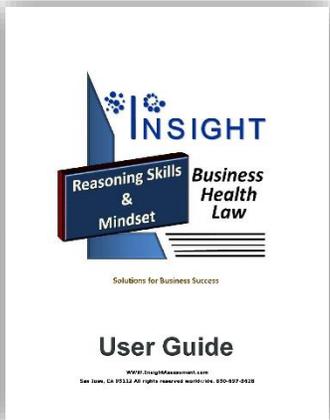
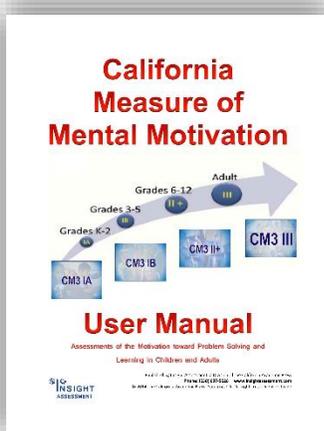
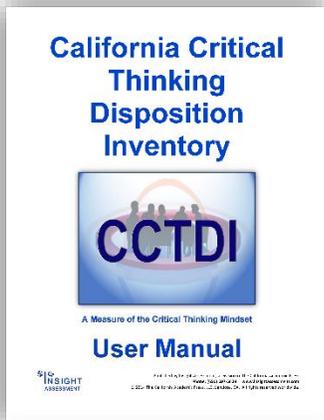
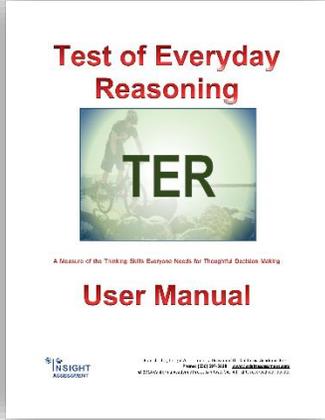
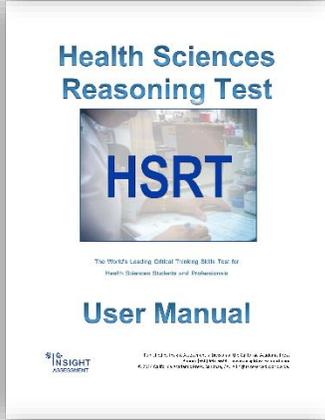
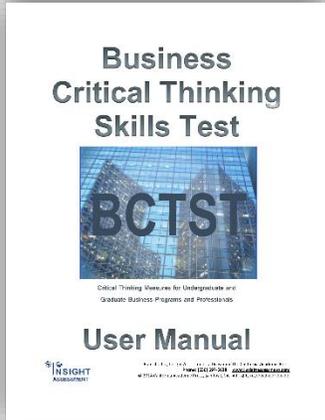
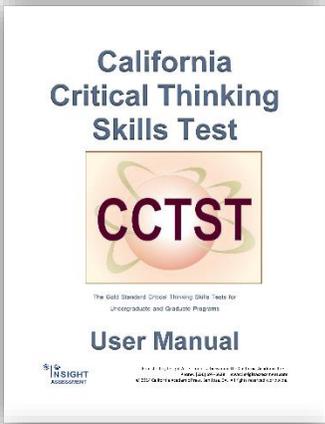
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"Critical Thinking for Life: Valuing, Measuring, and Training Critical Thinking in All its Forms," describes the work of Drs. Peter A. and Noreen C. Facione. The essay can be found in the Spring 2013 issue of *Inquiry* (Vol. XXVIII, No.1).

They and their co-investigators have been engaged in research and teaching about reasoning, decision-making, and effective individual and group thinking processes since 1967. Over the years they developed instruments to measure the core skills and habits of mind of effective thinking, these instruments are now in use in many different languages throughout the world. Since 1992 they have presented hundreds of workshops about effective teaching for thinking and about leadership, decision-making, leadership development, planning and budgeting, and learning outcomes assessment at national and international professional association meetings, business organizations, military bases, healthcare agencies, and on college and university throughout the nation.

Bios can be found at www.measuredreasons.com. Email the author at pfacione@measuredreasons.com.



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Question Asking Skills: A Leadership Training Tool

Asking clear and relevant questions is an essential leadership skill. Well focused questions gather important information, identify unspoken assumptions, clarify issues and explore options. Question asking is key in unfamiliar and uncertain problem situations. Building questioning skills is an important part of training thinking skills. Certain questions are associated with certain reasoning and decision skills.

Ask well focused, analytical and reflective questions only	
Interpretation	<ul style="list-style-type: none"> • What does this new observation/data mean? • What exactly is happening? • How should we understand that (e.g., what he or she just said)? • What is the best way to characterize/categorize/classify this? • In this context, what was intended by saying/doing that? • How can I/ we make sense out of this (experience, feeling, statement)?
Analysis	<ul style="list-style-type: none"> • Can you remind us of your reasons for making that claim? • What is your conclusion? What is it that you are claiming? • Why do you think that? • What are the arguments pro and con? • What assumptions must we make to accept that conclusion? • What is your basis for saying that?
Inference	<ul style="list-style-type: none"> • Given what we know so far, what conclusions can we draw? • Given what we know so far, what can we rule out? • What does this evidence imply? • If we abandoned/accepted that assumption, how would things change? • What additional information do we need to resolve this question? • If we believed these things, what would they imply for us going forward? • What are the consequences of doing things that way? • What are some alternatives we haven't yet explored? • Can we consider each option and see where it takes us? • Are there any undesirable consequences that we can and should foresee?
Evaluation	<ul style="list-style-type: none"> • How credible is that claim? • Why do we think we can trust what this person claims? • How strong are those arguments? • Do we have our facts right? • How confident can we be in our conclusion, given what we now know?
Explanation	<ul style="list-style-type: none"> • What were the specific findings/results of the investigation? • Can you tell us how you conducted that analysis? • How did you come to that interpretation? • Can you take us through your reasoning one more time? • Why do you think that (was the right answer/was the solution)? • How would you explain why this particular decision was made?
Self-Regulation	<ul style="list-style-type: none"> • Our position on this issue is still too vague; can we be more precise? • How good was our methodology, and how well did we follow it? • Is there a way we can reconcile these two apparently conflicting conclusions? • How good is our evidence? • OK, before we commit, what are we missing? • Can we revisit what we mean by certain terms/agreements before making a final decisions?

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Assessing Critical Thinking Framing Question

Planning Questions

1. What learning outcome(s) are we targeting?
2. Is our main goal formative (developmental) or summative?
3. Which curricular level should we assess?

Design

4. If we hope to show positive growth, do we have clean baseline / pretest data?
5. If we hope to show comparative strength, do we have relevant benchmark / norms?
6. If we hope to demonstrate accomplishing goals, do we a clear criteria of success?

Measurement

7. Do we have a focused, accurate, consensus definition of the construct we seek to measure?
8. Do we have one or more valid, reliable ways of gathering data about that construct?
9. Do we have a clear idea of which students we shall need to sample?
10. Must we gather data from them all, or can we use representative sampling?
11. How is assessment different than grading?

Logistical & Tactical

12. When, where, and how should we gather data?
13. How can we motivate student to give their best effort?
14. Who will collect and store the data?
15. Who will score, rate, compile and analyze the data?

Interpretation

16. By exit, what percentage of students should be at a given performance level?
17. How do we benchmark internally to our own past performance or to norms of actual or aspirational peers?
18. Do cross-sectional comparisons mean anything, or are the differences explainable by student attrition, maturation, selection bias, etc.?
19. What level of achievement should we have expected of our students as a group?
20. If we see gains, are they educationally significant and for which subgroups of students?

Communication

21. What have we learned from these results that can be used to improve student learning?
22. How will we share these findings with students, faculty, and other key stakeholder?

Overview of Thinking Tools and Techniques

These resources are offered with the adoption of assessment services

[The Culture of Thinking in your Organization](#) - Use this tool to assess the culture of thinking and decision-making that is characteristic of your organization. Consider how prevalent these manifestations of strength in thinking and decision making can be found in various working groups and in overall expectations. These characteristics can be difficult to achieve, but they are the hallmark of strong thinking organizations both in the leadership and in the membership. These ideas apply to all types of organizations: business, health sciences, education, defense, security, commerce.

[Perspectives that Influence Thinking and Knowing](#) - This tool describes seven different ways that individuals see the world. These varying perspectives have a profound effect on how a person interprets new information, identifies problems (or fails to), and determines how or whether the problems can be solved. Effective training programs aimed at reasoning and decision making skills and mindset account for the variation of knowledge perspectives present in the training group.

[Critical Thinking: What it is and Why It Counts](#) an essay written by Dr. Peter Facione, a leading authority in critical thinking. This essay is periodically updated to capture new findings and discussion points to help trainees explore the domain of critical thinking in all aspects of life and work. Author and the publisher hold copyright, ISBN 13: 978-1-891557-07-1. Permission is granted for paper, electronic, or digital copies to be made in unlimited amounts for purposes of advancing education and improving critical thinking, provided that distribution of copies is free of charge and properly cited when extracted in whole or in part.

[Techniques for Trainers of Reasoning Skills and Decision Making](#) Use these techniques to strengthen the training strategies you currently use to improve thinking skills and mindset in your trainee and student groups. Apply these strategies to all training exercises where the goal is to improve thoughtful problem identification and reflective decision making. Reflecting periodically on these three directives will offer you insights about your current best training practices and help you to focus your training efforts on critical thinking across content domains and educational contexts.

[Question Asking Skills: A Leadership Training Tool](#)- Asking clear and relevant questions is an essential leadership skill. Well focused questions gather important information, identify unspoken assumptions, clarify issues and explore options. Question asking is key in unfamiliar and uncertain problem situations. Building questioning skills is an important part of training thinking skills. Certain questions are associated with certain reasoning and decision skills.

[“Snap Judgments – Risks and Benefits of Heuristic Thinking”](#) There are two important systems at work in human thinking and decision making. One is a highly reflective judgment process (referred to often as ‘System Two’) and the other (‘System One’) is an heuristic process that relies on previous learning and sensory input. Both systems are at work all the time. Both systems are valuable to survival, and they check and balance each other when humans think well. Both need to be monitored for error to prevent poor decision making and lost opportunity. This material describes System One and cautions against common errors that occur in System One thinking. These pages are extracted from THINK Critically, Facione & Gittens, Pearson Education (3rd. edition) and offered here with the author’s permission.

[Training Session Feedback Form](#) - This tool is intended to function as both a self-evaluation tool for the trainee and as an evaluation of the training program itself for its ability to engage the learner as intended. Completing the feedback form guides the trainee to reflect specifically on their thinking experience related to the learning opportunity. Responses for each of the individual items are informative, and as a collection they serve as a subjective report of the trainee's engagement in the embedded training exercises aimed at improving thinking skills and mindset. This is not a direct measure of the objective quality of strength or weakness of the trainee's actual critical thinking ability.

[Strong Critical Thinking in Groups](#) is designed to trigger and augment the benefits of strong critical thinking that occurs in groups during projects, discussions or presentations. This one page tool guides evaluation of the quality of the thinking and decision making demonstrated by the group process. When used as a rating tool by someone evaluating the group process (perhaps as a leadership exercise), the rater is asked to explain the basis for his or her ratings of the group's work in framing and analyzing the problem, and formulating solutions. When used as a self-evaluation, this tool assists group participants to reflect on the quality of the thinking and problem solving just completed and marks the beginning of the evaluation of decisions made.

[The Holistic Critical Thinking Scoring Rubric \(HCTSR\)](#) is a rating tool that can be used to assess the quality of thinking in a spoken presentation or a written report/text. Apply the HCTSR when the presenter is required to be explicit about their thinking process or their reasons for advice given or decisions made. It can be used in any training program or evaluation process. Its greatest value is obtained when used by trainers to set expectations for written reports that require an evidence based recommendation or evaluation process. The clearly described criteria assist the trainee to internalize the characteristics of strong and weak critical thinking. The HCTSR is designed for developmental assessment, not for high stakes summative assessment. Train the raters well to make consistent and accurate ratings (judgments) about the evidence of critical thinking that they are observing and evaluating.

[Designing A Study of Workplace Productivity](#) - Use this tool to infuse strong reasoning and decision making into studies of workplace conditions or as an example of how strong thinking and decision skills are embedded in each step of an a well-designed investigation. Well-designed studies provide trustable information, poorly designed studies do not. This example examines factors that are believed to impact productivity. The same process could be used to study the variables that influence innovation.

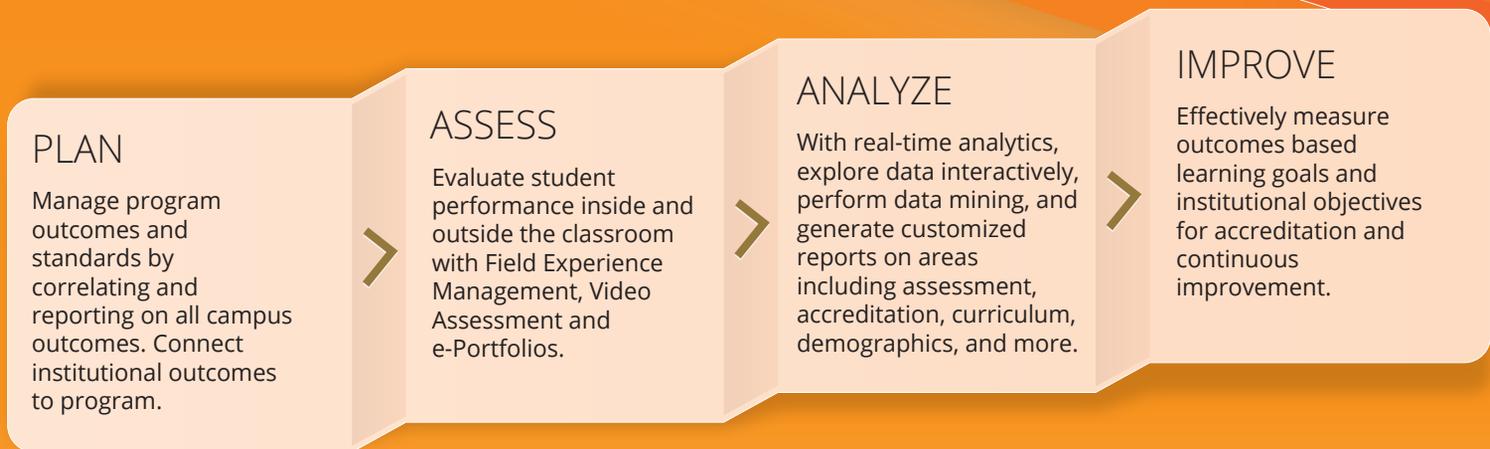
[Evaluating Written Argumentation \(REWA\)](#) is designed to provide detailed feedback on written material intended to argue persuasively on behalf of a given claim, opinion, or recommendation. REWA addresses eight different aspects of sound and effective writing: Purpose and Focus, Depth of Thought, Thesis, Reasoning, Organization, Voice, Grammar and Vocabulary, and Mechanics of Presentation. REWA presents the criteria for effective written communication. 'Highly Developed' writing (leftmost column) describes the desired performance in each area and 'Developed' writing describes a minimal standard for effective communications. Lesser ratings detail degrees of error or shortcoming.

[The Reflective Log](#) – Critical thinking is vital to your success in life and work. It's worth developing strong thinking skills. This critical thinking tool is intended to give structure and focus to journaling by students or trainees to integrate their insights about their thinking and decision making. Metacognition is trained through reflective writing. This version of the exercise, aimed at the undergraduate or novice professional, is easily adapted for use in other populations. Use the Reflective Log to coach trainee' self-monitoring and self-correction skills.





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EDUCATIONAL PROGRAMS

The Big Five: Addressing Core Competencies

Additional Resources

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RESOURCES

WSCUC

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RESOURCES

Oral Communication

Assessing Oral Communication

Susan Rickey Hatfield, Ph. D.

It's hard to imagine a degree in which some form of oral communication – either in public, interpersonal, or group settings – is not critical to students' success both in their lives and in the workplace.

Among employers, oral communication is one of the most sought-after skills. According to a 2013 survey that Hart Research Associates conducted on behalf of the Association of American Colleges and Universities, 93% of employers say that a demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than a candidate's undergraduate major (p.1). At the same time, oral communication was also the top area in which employers thought colleges and universities needed to place more emphasis (pg. 9). These findings come in spite of the fact that in a 2008 survey of 433 AAC&U member institutions, almost 70% of institutions reported having a common set of learning goals that included oral communication (Hart Research Associates 2009).

Defining Oral Communication

So the question is how to make the teaching, learning, and assessment of oral communication more effective. Defining what we mean by oral communication is an essential first step. Though oral communication is widely viewed as an essential skill, the nature of that skill is largely dependent upon the context in which the communication takes place and the manner in which it is demonstrated. Thus the definition may encompass a variety of communication contexts, ranging from public speaking to interpersonal conversation and small group discussion. The WASC Senior College and University Commission's definition of the competency takes that variability into consideration, stating that "oral communication may include speeches, presentations, discussions, dialogue, and other forms of interpersonal communication, either delivered face to face or mediated technologically" (2013 *Handbook of Accreditation*, p. 53).

Oral communication, like other higher-order intellectual skills such as quantitative reasoning, critical thinking, or information literacy, is a "meta-competency" that is best approached in an interdisciplinary, iterative, and integrated way, across the curriculum and arguably across the entire college experience. Thus, a second consideration is whether to define the outcome at the institutional level or at the level of a school, division, or program. In the WSCUC region, colleges and universities are encouraged to define oral communication in a way that makes sense for the institution, its mission, and its students, while still allowing for aggregation and reporting at higher levels. Schools that have identified oral communication as an institutional outcome or a general education distribution requirement may use their existing definition and oral communication learning outcomes – as well as the assessment infrastructure for examining those outcomes – as useful points of departure.

Third, as an overarching or meta-competency, oral communication needs to be translated into specific learning outcomes in order to provide a clear focus for the efforts of both faculty and

students. Regardless of the level at which oral communication is defined (e.g., institution, division, program), the resulting student learning outcome/s must be both specific and measurable. The articulation of student learning outcomes related to oral communication should follow good assessment practice. In other words, SLOs should be stated simply, as in the following: Students will be able to “*action verb*” “*something.*” Note that there is just one “*action verb*” and just one “*something.*” The more complex the outcome, the more difficult it will be to draw meaningful conclusions from the data collected. Thus it is important to avoid multiple action verbs (“Students will prepare, deliver, defend, respond to”) and multiple “*somethings*” (“.....in oral and written communication”). Otherwise, data will be difficult to interpret, challenging to act upon, and less likely to lead to improvements in teaching and learning. Learning outcomes for oral communication may include, for example, delivering a speech, debating an issue, advocating for a position, obtaining information through an interview, facilitating a workshop, counseling a client, negotiating an agreement, or leading a task-oriented team.

But it is not enough simply to identify outcome statements related to oral communication. Faculty also must agree on the performance characteristics or criteria against which achievement of the outcome will be assessed. Using common performance characteristics will facilitate the aggregation of data across faculty, disciplines, or the campus as a whole. This is not as complex as it sounds. Consider that oral communication involves creating meaning between two or more people. Given that definition, performance characteristics such as the following may be assessed in relation to many different situations: appropriateness of the speaker’s message, organization, rapport with the audience, credibility, delivery, language, style, nonverbal behaviors, listening, and responses.

These characteristics may serve for a variety of communication events, including the following: delivering a formal speech, engaging in an information-gathering interview, debating an issue with a classmate, or advocating for a position. Common performance characteristics or criteria, even when used across different learning outcomes, will allow an institution to demonstrate the degree to which students achieve competency in oral communication, because it will be possible to aggregate data on different performance characteristics that are common to multiple learning outcomes.

For instance, if the institution or a program decides to interpret oral communication as “Students will be able to deliver a public presentation,” it is important to have a common understanding of the performance characteristics of a public presentation that are critical to successful achievement. Performance characteristics should identify the key expectations that have been *agreed upon by faculty* for student achievement. Sharing those performance characteristics with students helps to focus their attention and their effort, in addition to helping students understand the aspects of the outcome valued by the program or college.

The Association of American Colleges and Universities has produced a series of faculty-created and –vetted rubrics known as the VALUE rubrics (for “valid assessment of learning in undergraduate education”). The VALUE rubric for oral communication can provide a useful

starting point for many institutions. AAC&U defines oral communication as “a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors.” Recognizing that oral communication is generally interpreted as public speaking, this VALUE rubric identifies performance criteria in the areas of organization, language, delivery, supporting material, and central message. While clearly applicable to a formal presentation, the rubric can easily be adapted to other forms of oral communication by either revising or adding to the rubric’s performance criteria.

Integrating Oral Communication into the Curriculum

Skills courses included in the general education curriculum are generally designed to serve as a common starting point or foundation on which students’ majors or professional studies will build in different ways. For instance, a basic public speaking course will help students develop foundational knowledge of how to deliver a message to an audience; however, students must then learn to adapt their generic knowledge and skill to the context, needs, and expectations in their specific field of study. If a discipline’s oral communication outcome states that “Students should be able to debate an issue,” it is easy to see how the organizational and delivery skills learned in a public speaking class could be transferred to the debate context. Still, additional study and practice will be required if students are to successfully translate their public speaking skills into this new context. This is an illustration of how developing competency in oral communication can be interdisciplinary, integrated, and iterative.

Like any skill, communication competency needs to be reinforced throughout the curriculum – not just introduced in general education and assessed in the capstone. Programs need to identify required courses throughout their curricula in which communication skills (as defined by the institution, college, or program) are developed and practiced, and where students receive feedback on their level of achievement. Developing a matrix that links program learning outcomes - including communication competency - to the individual courses in a specific curriculum provides an opportunity to see in which courses students are (or could be) developing their oral communication competency. This matrix will also identify logical courses for formative feedback on students’ oral communication skills.

Assessing Oral Communication

The latest edition of the National Communication Association’s *Large Scale Assessment in Oral Communication* (2007) summarizes more than 40 instruments designed to assess various aspects of communication. The volume does reference “The Competent Speaker Speech Evaluation” (a rubric for assessing public speaking), but the majority of tools included in the volume are based on self-reporting and designed to give students feedback on their communication behaviors rather than providing direct evidence of student performance. The authors of the volume caution that these tools “are not designed, nor should they be used, for any type of student outcome assessment” (p. vii).

Methods for assessing oral communication may be more complex than methods for assessing other outcomes because of the clear distinction between the knowledge of *how* to do it and

actual ability to do it. As Morreale, Backlund, Hay and Moore (2011) point out, while some disciplines can assess outcomes with an exam,

Communication is generally seen as a process skill, similar to reading and writing. While it is important to assess students' knowledge about how they should communicate, it is equally if not more important to assess their communication performance in authentic situations (p. 257).

Because of the temporal nature of oral communication (in any context), best practice would be to assess students in the actual communication situation. According to Morreale et. al. (2011),

The appropriateness and effectiveness of communication education is generally based on the situation and in the perceptions of the viewer or the impression made by the communicator on the observer (255-256).

Some core competencies may lend themselves to assessment during a college-wide assessment day. Many campuses set aside time (or entire days) and invite students to attend a session in which they are asked to respond to a prompt through writing or to take a test of some kind. Oral communication, however, generally requires students' advance preparation and research about the topic and the audience. Oral communication is not just about talking; it requires that talk *be about something*. The only exception might be if the learning outcome is "students can deliver an impromptu speech."

Because of the advance preparation required, the most logical place to assess oral communication skills is in the classroom, as part of an assignment. Another factor arguing for embedded or course-based assessment is quality of effort: What would the motivation be for a student to prepare for a debate, speech, or other oral communication performance that takes place outside of class, is ungraded, and is only used for assessment understood as accountability, rather than for feedback and improvement? Morreale and Backlund, (2007) conclude, "To the extent that assessment procedures offer no pretense for speaking other than evaluation, these procedures may yield somewhat inaccurate samples of communication performance" (p.6).

But assessing oral communication in the classroom brings other challenges. In a class of 20 or 25 students, assessment can appear daunting, if not prohibitive -- especially if the outcome requires individual student performances. For instance, if each member of a class of 25 students were to deliver a 6- to 8-minute in-class presentation, almost two weeks of class time would need to be dedicated to student performance. Many courses simply do not have the luxury of dedicating this much time to an oral communication outcome, even when the content presented by students is directly related to the course. And there is the problem of inter-rater reliability when multiple instructors from multiple courses are involved. As Morreale and Backlund (2007) point out, this approach "would seem to exacerbate the problem of rating error, although with effective training, rater error can be minimized" (p. 7). Despite such challenges, however, assessing students' communication in the context in which it occurs

provides the most accurate representation of students' skills.

In cases where the methodology of assessing students' skills in the actual setting creates prohibitive challenges, sophisticated and unobtrusive recording options can make performance assessment by means of video recording a viable alternative. Recordings can then be collected in individual student portfolios or in files organized by outcome for online review by faculty and other educators. Even then, however, significant time, effort, and preparation are required.

Outcomes related to facilitating group discussions or participating in debates can involve the assessment of several students at the same time, but great skill is required to assess individual performance in a complex multi-student interaction. Recording the discussion is likely to be necessary, particularly if multiple instructors or others are involved in the assessment.

Assessment Tools

If carefully designed, a number of assessment tools may be useful in the assessment of students' oral communication competence. The choice of assessment tool depends upon the specific learning outcome, the tool's alignment with the outcome, and the faculty's comfort level with assessing students' oral communication skills. The following types of instruments have been chosen to illustrate both different types of instruments and how performance characteristics can be developed (and modified) to serve across different oral communication outcomes.

Checklists

This basic assessment method identifies a list of characteristics that are judged to be either present or not present in student work.

Sample Assessment Checklist for an Oral Communication Outcome

	No	Yes	Comments
Content and Organization			
Was the purpose for the session clearly stated?			
Was the speaker prepared?			
Did the speaker develop rapport with the audience?			
Did the speaker provide an overview of the purpose and direction of the message?			
Were the main points clearly stated?			
Were changes in topics handled smoothly?			
Did the speaker pick up on/ respond to audience cues?			
Did the speaker support claims with evidence and use sound reasoning?			

Did the conclusions end the situation appropriately?			
Style and Delivery			
Were ideas presented concretely and specifically?			
Was the language appropriate to the situation and audience?			
Did the speaker appear engaged in the situation?			
Did the speaker use good eye contact?			
Was an appropriate conversational style used?			
Was the speaker poised?			
Overall			
Did the speaker create a positive impression?			
Was the speaker's purpose achieved?			

Scales

Rating scales allow the assessment of the degree to which the characteristics of successful performance are present. Performance levels can be simply numerical (1-5), anchored with descriptions for the endpoints of the scale (needs improvement – very good), or anchored to a descriptor at every point (excellent – very good – good – needs improvement – not present).

It is also possible to create differentiated anchor descriptions for different items or for each cluster of items to be assessed.

Sample Assessment Scale for an Oral Communication Outcome

1= not present 2= somewhat present 3=acceptable 4=notable 5= excellent

Content and Organization	Score	Comments
The purpose for the session was clearly stated		
The speaker was prepared		
The speaker developed rapport with the audience		
The speaker provided an overview of the purpose and direction of the message		
Main points were clearly stated		
Changes in topics were handled smoothly		

The speaker picked up on/ responded to audience cues		
The speaker supported claims with evidence and used sound reasoning		
The conclusions ended the situation appropriately		
Style and Delivery		
Ideas were presented concretely and specifically		
Language was appropriate to the situation and audience		
The speaker appeared engaged in the situation		
The speaker used good eye contact		
An appropriate conversational style was used		
The speaker was poised and confident		
Overall		
The speaker created a positive impression		
The speaker's purpose was achieved		

Rubrics

Instead of using numbers to indicate the relative quality of students' work, a rubric may use the same categories as a scale, but instead of numbers – or in addition to them – a rubric includes specific descriptions of the student performance at each of the different levels. Unlike scales and checklists, rubrics provide more detailed feedback to the student in addition to providing useful information for purposes of reporting and improvement of teaching, learning, and other educational experiences.

Additionally, the performance descriptions in rubrics may help promote inter-rater reliability among faculty who may be unclear as to what exactly constitutes the difference between a level “3” performance and a level “4” performance in an assessment scale.

Analytical Rubrics. Analytical rubrics identify specific performance characteristics that contribute to successful communication in the identified context. At their most basic level, analytical rubrics contain descriptions of student performance that “does not meet”, “meets”

or “exceeds” expectations for performance on each of the performance characteristics. Current assessment practice favors an even number of choices in order to push raters toward a higher or lower rating and to avoid central tendency

Sample Analytical Rubric for an Oral Communication Outcome

Purpose	Purpose of communication is unclear or ill defined	Purpose is appropriate to audience and occasion	Communication is tailored to this specific event and focused on needs of the audience
Message	Communication is hard to follow and seems to lack structure	Communication is planned and message is organized	Communication has logical flow and is easy to follow.
Content	Information is simplistic or already known to the audience. Contains errors of fact.	Some information presented is new to the audience. Information is largely accurate.	New, accurate information is presented that builds on what the audience already understands
Audience-Centered	No evidence of analysis of audience or situation	Speaker acknowledges audience indirectly	Speaker establishes common ground with audience. Responds and adapts to audience feedback
Delivery	Speaker seems uncertain. Aspects of verbal or nonverbal delivery detract from the speakers message	Verbal and nonverbal behavior are appropriate to the audience and occasion	Speaker is polished and professional. Verbal and nonverbal delivery enhance presentation and engage audience
Ending	Ending is abrupt or does not create closure	Presents summary of points presented	Ending is planned, well executed, memorable.
Impact	Communication has minimal impact on audience	Audience responds positively to speaker and message	Audience responds enthusiastically to communication.

Holistic rubrics. Unlike analytical rubrics, holistic rubrics do not assess student performance on each individual criterion but instead provide an overall assessment, with multiple performance dimensions folded into the judgment at each level. Holistic rubrics can provide an overall assessment of student performance because a student performance is likely to represent qualities at several different performance levels. However, the assessment is more general and therefore offers less specific feedback to students –as well as to faculty and other educators -- than is possible with analytical rubrics.

Sample Holistic Rubric for an Oral Communication Outcome

Needs more attention/ Developing

The speaker's purpose is unclear or inappropriate to the situation. The speaker appears to be unprepared or only minimally prepared for the event, as evidenced by a lack of structure or focus to the presentation. Evidence and reasoning is either not used, not cited, or does not support the claims being made. The speaker is not connecting with the audience because either the presentation is not tailored to the specific situation (appropriate language or relevance of topic or examples), or the delivery is not engaging (limited eye contact, nervous mannerisms, overreliance on notes or script, inappropriate presentation style for audience or situation). The end of the presentation is abrupt or lacks closure. The overall impression is that the presentation did not meet the needs of the audience.

Adequate / Acceptable

The speaker is focused on what is to be accomplished and the audience is given an idea of what to expect. The presentation is organized and easy to follow. The conclusion is definite and planned. Claims are supported by evidence, and sound reasoning is used. The audience is acknowledged and there is some evidence that the presentation was tailored to the specific situation. The speaker does a nice job of presenting the material.

Notable / Exemplary

The speaker's purpose is clearly stated and tailored to both the audience and situation. The speaker appears to be very prepared and demonstrates the ability to adjust to meet the needs of the audience. The speaker prepares the audience by providing an overview of the purpose and content of the presentation. There is a coherent flow to the presentation. Sound evidence and reasoning are used, and sources are credentialed and cited. The speaker uses clear, specific, and vivid language to create understanding. The speaker's attitude, style, and nonverbal behaviors engage the audience. The overall presentation is memorable and professional.

Implementing Oral Communication Assessment

Though assessing students in communication at the completion of a general education curriculum would be easy to implement from a methodological perspective, employers, policy

makers, and the public are more interested in how students perform when they graduate from a college or university and enter the workplace. Few graduating students will be able to replicate or develop a skill learned in a first-year general education course if they have not had the chance for additional practice and feedback in upper-division and major coursework. Additionally, students need help to contextualize a basic or generic skill to the requirements of a particular discipline or field – or to a co-curricular area such as service learning. For instance, because a student performed well in a general education course in interpersonal communication does not mean that three years later the student will be able to conduct an effective family interview in her social work internship without specialized training and an opportunity to practice.

Across-the-curriculum (XC) initiatives for writing have been common in universities for the past two decades. More recently, XC initiatives in diversity, ethics, critical thinking, and information literacy have gained traction. Campus-wide communication-across-the-curriculum initiatives (CXC) are also becoming very common. These initiatives require that each program’s curriculum identify specific assignments or other activities, in courses and other contexts such as internships or community service projects, that extend, enhance, and contextualize student’s oral communication skills.

Communication-intensive courses should meet and document adherence to a clear set of requirements. For instance, courses that are designated as oral-communication intensive might require that students:

- individually present or obtain information through oral communication
- research a situation and form an appropriate communication goal
- adapt their speaking style and messages to specific situations and audiences
- attend to audience feedback and responses during the presentation, and
- receive appropriate feedback from teachers and peers, including suggestions for improvement

A CXC initiative – whether implemented at the program level, in upper-division general education courses, in electives, or the co-curriculum -- can address the challenge of extending an entry-level general education skill into the major, offering opportunities for students to learn to adapt general skills to serve the specific requirements of the discipline *and* providing convenient assessment points toward the end of the student’s college career – “at or near graduation,” in the words of the WSCUC 2013 *Handbook of Accreditation*.

Conclusion

Colleges and universities have significant flexibility in choosing the ways they will define oral communication and assess it – and given the value placed on oral communication beyond the academy, it is essential that they do so. Institutions may wish to consider oral communication a campus-wide learning outcome with a broad definition and performance characteristics; or they may ask colleges, divisions, and programs to determine the specific type of oral communication skills required by their students as they begin their professional careers; or they

may choose to do both. In any case, the implementation of large-scale assessment of this competency will require a careful analysis not only of what constitutes effective oral performance, but also how a program curriculum supports students in the development of those communication skills. Ultimately, it will also require articulation of expectations for the level of performance of graduates and an honest appraisal of how well the institution is succeeding in helping students to meet those expectations.

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Campus Initiatives

Capital University

<http://www.capital.edu/oral-communication/>

East Tennessee State

<http://www.etsu.edu/uged/gened/faculty/ICOM.aspx>

Eastern Illinois University

<http://www.eiu.edu/~assess/sac.php>

Louisiana State

<http://sites01.lsu.edu/wp/cxc/>

<https://www.facebook.com/lsucxc>

<http://sites01.lsu.edu/wp/cxc/files/2011/11/Official-C-I-Certification-Criteria.pdf>

Massachusetts Institute of Technology

<http://web.mit.edu/fnl/volume/221/perelman.html>

http://web.mit.edu/commreq/CR_Assessment_ExSummary.pdf

Michigan State (resources)

<http://fod.msu.edu/oir/oral-communication-communication-across-curriculum>

North Carolina State University

<http://www.ncsu.edu/cwsp/QandA/programs.php>

Randolph - Macon College

<http://www.rmc.edu/Offices/higgins-academic-center/Resources%20for%20Students/SAC%20for%20Students/facultyresources.aspx>

Rensselaer Polytechnic Institute

<http://registrar.rpi.edu/update.do?artcenterkey=208>

University of North Carolina Greensboro

<http://www.uncg.edu/cac/default.php>

<http://www.uncg.edu/cac/wisiprogram/sguidelines.php>

http://www.uncg.edu/cac/forms/CAC_Faculty_Guide.pdf

University of Pittsburgh

<http://www.speaking.pitt.edu/about/>

University of Rhode Island

<http://www.uri.edu/artsci/com/comfund/cxc.html>

RESOURCES

Written Communication

Writing and Assessing Writing in Postsecondary Education: Where We've Been and Where We're Going

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The teaching of writing in United States' postsecondary education began earnestly and systematically during the middle 20th century. Before that, students enrolled in writing classes, of course, but most of those were literature classes where students composed in response to close readings of literary texts. In the midst of the 20th century, however, two related events occurred that changed the history of postsecondary writing instruction. First, the GI Bill enfranchised a large new population of students; colleges and universities, which in the 1940s enrolled a mere 6% of high school graduates, began opening their doors to soldiers ready to complete their education and begin a post-World War II life. Second, in 1949 teachers of writing associated with the National Council of Teachers of English came together to form a new organization, the Conference on College Composition and Communication, whose sole purpose was (and continues to be) to promote the study and teaching of writing. In the decades since then, the teaching of writing has changed in many ways, and the assessment of writing, once dominated by multiple choice tests, has also come into its own. In fact, as this essay argues, assessment plays a unique role in composition.

Here, then—in the hope that this brief history of composition and its assessment will help interested faculty address writing more effectively as a core competency across an institution—I both describe five significant shifts in the teaching of writing that continue to affect its teaching and provide a thumbnail history of assessment activity in composition contexts.

1949-2014: Five Shifts in the Teaching of Writing

In the United States, writing changed in five significant ways during the second half of the 20th century: (1) teachers taught writing as a process; (2) writing teachers worked with colleagues in other disciplines to develop writing-across-the-curriculum and writing-in-the-disciplines writing programs; (3) teachers and writing program directors began designing and offering writing classes keyed to outcomes, often in dialogue with a national outcomes statement created by the Council of Writing Program Administrators; (4) teachers began teaching composing as a computer-enhanced activity; and (5) composition teachers and scholars began developing writing courses specifically created to assist students in transferring writing knowledge and practice from first-year composition classes into other sites of writing.

Teaching Writing as a Process. In the 1960s and 1970s composition teachers—for example, Janet Emig interviewing high school students and Sondra Perl interviewing basic writers in college—began exploring the idea that writing is a process that could be taught in the classroom. If this were so, these teachers said, then the product-orientation governing writing classes—where students were assigned writing tasks but were generally not given help in how to complete them—could be dramatically transformed, from a classroom focused on analyzing texts in class and having students write outside of class to one where students composed in class and where writing process itself would focus the class. Since that time, writing process has provided the centerpiece of composition classes (Fulkerson), although the process approach that teachers take varies. Some, for example, employ a freewriting Elbowian Expressionist approach; some adapt a Flower and Hayes’ cognitivist approach; and others call on an approach located in rhetorical invention (Lauer). Moreover, the research shows that once in college, students develop an elaborated writing process, including multiple drafts and peer review; they understand its value; and they take an adapted form of it into their other classes (for a summary of this research, see Yancey, Robertson, and Taczak).

Developing WAC and WID Programs. The beginnings of Writing across the Curriculum (WAC)

programs, focusing on writing-to-learn activities, and Writing in the Disciplines (WID) programs, addressing the genres and discourse communities that members of a discipline write in, have various beginnings--at Beaver College, Carleton College, and Michigan Technological University—but each of them was intended to support students as they wrote in sites outside the English department or composition classroom. Today, most four-year schools and many two-year schools have some form of WAC or WID program, which provides students with writing experiences in their areas of study. As important, as Charles Bazerman has observed, in working with colleagues across the curriculum, writing specialists have become much more knowledgeable about how writing actually works in other fields.

The Role of Outcomes. In 2000, the Council of Writing Program Administrators, a group of writing specialists who take on various administrative responsibilities (e.g., Writing Program Administrator; Writing Center Director; WAC Director), approved the first WPA Outcomes Statement. It stipulated four kinds of knowledge: (1) rhetorical knowledge; (2) critical reading, thinking, and writing; (3) composing processes; and (4) knowledge of conventions. The idea behind the outcomes was threefold: the statement articulated what students completing any version of first-year composition (FYC) would know and be able to do, whether it be a one-term first-year seminar or a two-semester digitally enhanced FYC set of courses; local institutions could set their own benchmarks and use the outcomes for assessment; and local institutions could adapt them so that they spoke to local cultures while at the same time being in dialogue with the national statement. Many institutions used the document, and did so for different purposes, for example to help students understand the goals of an FYC course, to design curriculum, and for program assessment. In 2008, the WPA Outcomes were adjusted to include a fifth outcome, the use of digital technologies in writing, thus illustrating another aspect of these outcomes: they can and should be revised. It's perhaps not surprising, then, that during 2012-2014 the WPA Outcomes have been

revised yet again: in this revision, which is included below, digital technologies are woven into the outcomes, as opposed to representing an independent outcome; many of the outcomes are more clearly defined; and the role of faculty across the disciplines has been emphasized. As of this writing, the WPA Outcomes Task Force is hoping that the new statement will be approved by July 2014.

Teaching Composing as a Computer-Enhanced Practice. The first PC was created in the 1970s, and pioneering writing teachers were not far behind in thinking about how digital technologies might change our writing practices and thus ought to influence the way we teach writing. During the 1980s and 1990s, many writing programs offered some writing courses, especially technical communication courses, in computer labs and computer classrooms, but writing classes overall continued to be largely an exercise in print. However, in the 1990s and into the 2000s, with computers becoming ubiquitous and with more faculty and students using computers in their lives outside of school, writing classes began including composing as an electronic process, so much so that the “Technology Plank,” as explained above, was added to the WPA Outcomes Statement:

Composing in Electronic Environments

As has become clear over the last twenty years, writing in the 21st-century involves the use of digital technologies for several purposes, from drafting to peer reviewing to editing. Therefore, although the *kinds* of composing processes and texts expected from students vary across programs and institutions, there are nonetheless common expectations.

By the end of first-year composition, students should:

- Use electronic environments for drafting, reviewing, revising, editing, and sharing texts
- Locate, evaluate, organize, and use research material collected from electronic sources, including scholarly library databases; other official databases (e.g., federal government databases); and informal electronic networks and internet sources
- Understand and exploit the differences in the rhetorical strategies and in the affordances available for both print and electronic composing processes and texts

Faculty in all programs and departments can build on this preparation by helping students learn

- How to engage in the electronic research and composing processes common in their fields

- How to disseminate texts in both print and electronic forms in their fields

The teaching of writing thus included the processes of writing—*drafting, peer reviewing, and editing*—in digital formats and electronic environments as well as the research activities—[l]ocat[ing], evaluat[ing], organiz[ing], and us[ing] research material—that are a staple of FYC. Moreover, since 2000, many writing programs have incorporated multimodality into their curricula; either as a requirement or as an option, students often create electronically mediated texts like photo essays, blogs, presentation slides, and electronic portfolios.

The Transfer of Writing Knowledge and Practice. In 1987 Lucille McCarthy published “A Stranger in Strange Lands: A College Student Writing Across the Curriculum” documenting the writerly progress of Dave in three courses—FYC, literature, and biology. A science major, Dave had no theory of writing and could see no connection from one class to the next. In McCarthy’s formation, he did not transfer what he learned in one site to another: he was a stranger in a strange land. Since that compelling portrait was published, researchers have continued to study students’ transfer of writing knowledge and practice, but they don’t all agree on its feasibility. Some scholars—for example, David Smit and David Russell—claim that given the situated-ness of writing, transfer is difficult at best. Other scholars—for instance, Doug Downs and Elizabeth Wardle, and Rebecca Nowacek—demonstrate that such transfer is possible, though inconsistent. Most recently, Kathleen Blake Yancey, Liane Robertson, and Kara Taczak in *Writing across Contexts: Transfer, Composition, and Sites of Writing* offer a model of a writing curriculum explicitly designed for transfer—what they call the Teaching for Transfer (TFT) curriculum—keyed to two features: (1) a set of key terms that students read about and use in writing assignments and (2) a set of systematic analytical reflective activities linked both to writing assignments and to ways that students can use what they are learning to help them in other writing sites. The *Writing across Contexts* research demonstrates that with these terms and practices, students were able to recontextualize what they had learned in the TFT course

for new writing tasks. Put another way, the key terms and reflective practices functioned as a kind of passport into the new writing sites—in disciplines ranging from humanities and film to chemistry and physics—that students entered. Given these results, the TFT course points us toward specific curricular features—key terms and reflective practice--that provide a framework for consistently supporting students’ transfer of writing knowledge and practice. As important, Yancey, Robertson, and Taczak also traced students’ use of prior knowledge, which they theorized in three ways: as assemblage, which occurs when students atomistically graft disconnected, almost arbitrary new concepts onto earlier prior knowledge; remix, a process through which students integrate new knowledge with prior knowledge for a more sophisticated and flexible account of writing; and critical incident, or setback, a situation in which students encounter a failure in writing and use it to re-theorize their own understanding of writing knowledge and practice.

Writing Assessment in the 21st Century

In the latter part of the 20th century, and even today, writing may be assessed indirectly, that is, not with a demonstration of writing itself but with a test of a skill assumed to be related to writing. Thus the SAT “writing” test—soon to be deleted as a standard feature of the SAT-- includes as 2/3 of its score a multiple-choice test of grammar and usage. For the remaining 1/3, it includes a writing sample that students produce, and until the 1990s, those two methods—a multiple-choice test and a single impromptu writing sample—were the most common methods of assessing writing. In the 1990s, however, portfolios of writing—characterized through processes of collection, selection, and reflection—became increasingly popular. These three methods, what Yancey has called three waves of writing assessment, continue to dominate the field, although several programs are moving to electronic portfolios. Like their print counterparts, electronic portfolios begin with collection, selection, and reflection, but they include a wider array of texts as well as the multiple contexts available on the web.

The methods of evaluating such “tests” of writing also vary. Scoring a multiple-choice test is both efficient and cheap, which is one reason such a test is popular. Scoring a single piece of writing with a scoring guide is a consistent feature of many state tests; students are familiar with scoring guides, benchmarks, and ways that they can both support and depress learning. Portfolios are likewise scored with a rubric, typically one that a reader uses to read across the set of portfolio texts. The Carleton College WAC portfolio scoring guide, for instance, requires students to demonstrate a wide variety of rhetorical strategies as well as create a reflection speaking to a student’s accomplishment:

Write a reflective essay in which you argue for your accomplishments on the writing tasks listed below, using your papers as evidence. This essay is typically read first, giving the readers of your portfolio insight into your thinking about your writing. You will have chosen the work and provided some information about the assignments, but only you can explain how your portfolio demonstrates your accomplishments as a writer. This essay will not count toward the total number of pages (10-30) or papers (3-5) for the portfolio itself. Other requirements:

1. Papers from at least **three different departments or programs**. **Please do not submit more than one paper from a single course - variety shows your breadth as a writer;**
2. At least one paper that reports on **something you have observed** (for example, field notes for science or social science courses, a laboratory report, a description of art, a play, or music, etc.);
3. At least one paper that demonstrates your **ability to analyze complex information** (for example, numeric data, multiple texts, multiple observations, etc.);
4. At least one paper that provides **interpretation** (of data, a text, a performance, etc.);

5. At least one paper that demonstrates your ability to **identify and effectively use appropriate sources** (other than the primary text for the assignment), properly documented;
6. At least one paper that shows your ability to articulate and support a **thesis-driven argument**;
7. Evidence that you can effectively control **Standard American English in multiple curricular settings**.

Once submitted, the portfolio is read for five overarching features:

Score (circle one):	Needs Work	Pass	Exemplary
<i>From the Carleton catalog: To guide students as they begin to work on writing at the college level, the College has developed some general criteria for good writing at Carleton. Although individual assignments, genres, or disciplines may place more or less emphasis on each criterion, faculty agree that student writing should feature the following:</i>			
The rhetorical strategy and diction should be appropriate for the audience and purpose.	Demonstrates partially	Demonstrates adequately	Demonstrates fully
If argument is a part of the rhetorical strategy, it should contain a thesis and develop that thesis with coherence, logic, and evidence.			
Whatever the purpose, writing should be as clear, concise, and interesting as possible.			
Narration, description, and reporting should contribute to analysis and synthesis.			
Writing should be edited to address surface error, including irregularities in grammar, syntax, diction, and punctuation.			

Such assessment is called summative: it's designed to report out a final formal score.

Teachers tend to be more interested in formative assessment, that is, assessment designed to support students in the process of learning. Some teachers employ a form of reflection, one perhaps that allows students to comment on writing processes, or to articulate what they have learned in completing an assignment, or to synthesize learning across assignments and reading. Typically, the reflection is not scored or graded separately, though it can and does contribute to the assessment of a portfolio. Teachers also provide a response to student work; this can be provided in print, in conference, and via digitally enhanced audio. Though the research on the role of response in

assisting students to improve as writers isn't robust, students react very favorably to response, and teachers continue to understand it as a critical part of the composing classroom.

Three other areas of assessment show some promise. First is a placement exercise called Directed Self Placement (DSP). Though the practice varies, students typically (1) are given a scenario showing them what different tiers of classes, oriented to developmental achievement, are offered, and then (2) are asked to decide which one would be best for them, given their sense of themselves as writers. There is some evidence to show that this form of student reflective self-assessment increases motivation and can place students as well as, if not better than, other forms like multiple-choice tests and impromptu essays (see the Royer and Gilles edited collection of essays on the topic). Second is assessment of behaviors that are component parts of composing, specifically of a student's coachability in terms of responsiveness to and use of feedback and of a student's ability to provide peer review. Though some efforts have been made in this direction and the concept shows promise, no research on these areas has been published. Third is the engagement of students, in a classroom, in negotiating a rubric that then is used to score or grade a piece of student work. Recent research on this (Cirio) raises very good questions about the role of vocabulary in such an exercise; if students don't have the vocabulary of writing—terms like genre, context, audience, and purpose, for example—they find such negotiation very difficult if not impossible.

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Given this quick overview, we can see that learning to write is a lifelong, complex process. The overview also shows that we have made great strides in the last 65 years. We now have research that can help us in our threefold institutional writing efforts: (1) designing writing programs; (2) developing writing pedagogies in line with the programs; and (3) creating assessments, both in the classroom and in the program, that can signal to students what they are doing well and what they need to do better and that can assist programs in program enhancement, as well.

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SOME RESOURCES FOR WRITING AND FOR ELECTRONIC PORTFOLIOS

Assessing Writing (journal).

Conference on College Composition and Communication Position Statements:
<http://www.ncte.org/cccc/resources/positions>

Council of Writing Program Administrators Writing Assessment Gallery:
<http://wpacouncil.org/assessment-models>

Journal of Writing Assessment: <http://journalofwritingassessment.org/>

WPA-CompPile Research Bibliographies: <http://comppile.org/wpa/bibliographies/>

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American Association of Colleges and Universities VALUE Project:
<http://www.aacu.org/value/index.cfm>

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RESOURCES

Quantitative Reasoning

Quantitative Reasoning: The Final Frontier of Core Competencies
Susan Elrod, Dean, College of Science and Mathematics, Fresno State

Introduction. Quantitative literacy. Quantitative reasoning. Quantitative fluency. These are phrases that are often used when discussing one of the key learning outcomes for higher education. Here are a few high-profile examples:

- The WASC Senior College and University Commission focuses on five core competencies -- writing, oral communication, quantitative reasoning, critical thinking, and information literacy – in its 2013 institutional review process.
- Quantitative reasoning is one of the LEAP (Liberal Education for America’s Promise) Essential Learning Outcomes (or ELOs) developed by the Association of American Colleges & Universities (AAC&U) , along with inquiry and analysis, critical and creative thinking, written and oral communication, information literacy and teamwork and problem solving.
- The Lumina Foundation’s Degree Qualifications Profile (DQP) calls this skill quantitative fluency and places it, like LEAP, among several important intellectual skills: analytic inquiry, information literacy, engaging diverse perspectives, and communication fluency.

The ability to think quantitatively clearly plays a central role in undergraduate education. But what do phrases like quantitative literacy, quantitative reasoning, or quantitative fluency really mean for student learning, the curriculum, program development, faculty development, or accreditation? How do we teach and measure it? Who is responsible for ensuring that students achieve this

competency? This essay will define QR; discuss the role of QR in the undergraduate curriculum; present ways to define and assess QR outcomes; and finally suggest approaches to faculty development in QR. Throughout, I will provide examples of campus practice.

Defining Quantitative Reasoning.

Quantitative reasoning

is the application of basic mathematics skills, such as algebra, to the analysis and interpretation of real world quantitative information in the context of a discipline to draw conclusions that are

Box 1. What is it?

“Some call it **Numeracy**, an expression first used in the UK's 1959 "Crowther Report" to include secondary school students' ability to reason and solve sophisticated quantitative problems, their basic understanding of the scientific method, and their ability to communicate at a substantial level about quantitative issues in everyday life. Others call it **Quantitative Literacy (QL)**, and describe this comfort, competency, and "habit of mind" in working with numerical data as being as important in today's highly quantitative society as reading and writing were in previous generations. Still others refer to it as **Quantitative Reasoning (QR)**, emphasizing the higher-order reasoning and critical thinking skills needed to understand and to create sophisticated arguments supported by quantitative data.”

From the National Numeracy Network’s website:

<http://serc.carleton.edu/nnn/index.html>

relevant to students in their daily lives. It is not just mathematics. Carleton College, for example, views QR as “the habit of mind to consider the power and limitations of quantitative evidence in the evaluation, construction, and communication of arguments in public, professional, and personal life.” The term numeracy is also used in conjunction with these skills. A comprehensive statement of all three of these phrases is provided by the National Numeracy Network (NNN), an organization devoted to advancing quantitative reasoning learning, assessment, and program development in higher education (see Box 1). Ultimately, quantitative reasoning requires students to think critically and apply basic mathematics and statistics skills to interpret data, draw conclusions and/or solve problems within a disciplinary context (Figure 1). Indeed it requires the kind of mathematical and statistical skills generally learned by high school, so all college students should be able to achieve this outcome. It is a competency of integration and application, both of which are intellectual capacities up near the top of the cognitive skills taxonomy originally described by Bloom (1956). Thus, higher education faculty and administrators must address ways to provide students with learning opportunities to understand and practice this set of skills.

Figure 1. QR within the Undergraduate Curriculum



QR in the Curriculum. The development of intellectual skills is paramount for undergraduate students. AAC&U states that intellectual and practical skills should be “practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects and standards for performance.” The Degree Qualifications Profile provides another lens through which to view these skills, stating that “students hone and integrate” these skills across the curriculum when dealing with problems in their major field of study, but also with “broad, integrative problem-solving challenges.” Thus QR appears to be much more than a general education learning outcome; it must be accomplished within the major, but also beyond it. Deborah Hughes-Hallett (2001) argues that QR must be taught in the context of the disciplines

because a critical component is the ability to identify quantitative relationships in a range of contexts. She also argues that the very nature of QR is interdisciplinary because it involves contextual problem solving in real-world situations. Yet general education is where many campuses locate the teaching, learning, and assessment of core competencies like QR.

Examples of QR in everyday life abound and can be drawn upon to teach QR in the context of virtually any discipline. They can be found in areas such as health, economics, politics, science, engineering, social science, and even the arts. For example, virtually all parents face the vaccination question early in the life of their children. Parents might ask questions like, “What are the risks associated with vaccinating my child? What are the benefits?” In order to answer these questions, they must take into account quantitative information, such as disease occurrence rates in populations over time, or numbers of cases of complications with certain vaccine preparations. In today’s information age, the Internet is the most readily available source of information, so students (and adults) must be able to discern reliable versus non-reliable sources. Returning to our vaccination example, there is rampant misinformation online about a connection between autism and vaccinations that must be recognized as such when parents formulate their decisions. Making judgments based on political polling data, understanding the national debt, interpreting nutrition facts, evaluating medical treatment or screening options, making investment decisions, and even purchasing decisions – these are all everyday challenges that require us to use quantitative reasoning skills.

Larger societal issues, such as climate change, also require the application of QR skills – and the closing of a widening gap between those who have these skills and those who do not. Issues like these are politically contentious, beyond the practical implications for everyday life and decision-making (should I buy a hybrid car? Should I buy carbon credits?). The “hockey stick” graph of rising CO₂ levels made worldwide news as politicians debated the science behind climate change, or global warming as it was known in the past decade. Jon D. Miller, a political scientist at University of Michigan who has been studying the civic scientific literacy of adults in the U.S.; in surveys that ask basic factual scientific questions, he finds that less than 30% are scientifically literate (Miller, 2010). Anthony Carnevale, Director of Research at the Center on Education and the Workforce at Georgetown University, argues that, “The remedy for the widening gulf between those who are literate in mathematics and science and those who are not is democratization – making mathematics and science more accessible and responsive...to the needs of all citizens” (in Steen, 2004, p.65). One way to achieve this may be through a more intensive focus on quantitative reasoning in college. There are implications for all levels of education, preschool through college, but our focus here is on the undergraduate curriculum.

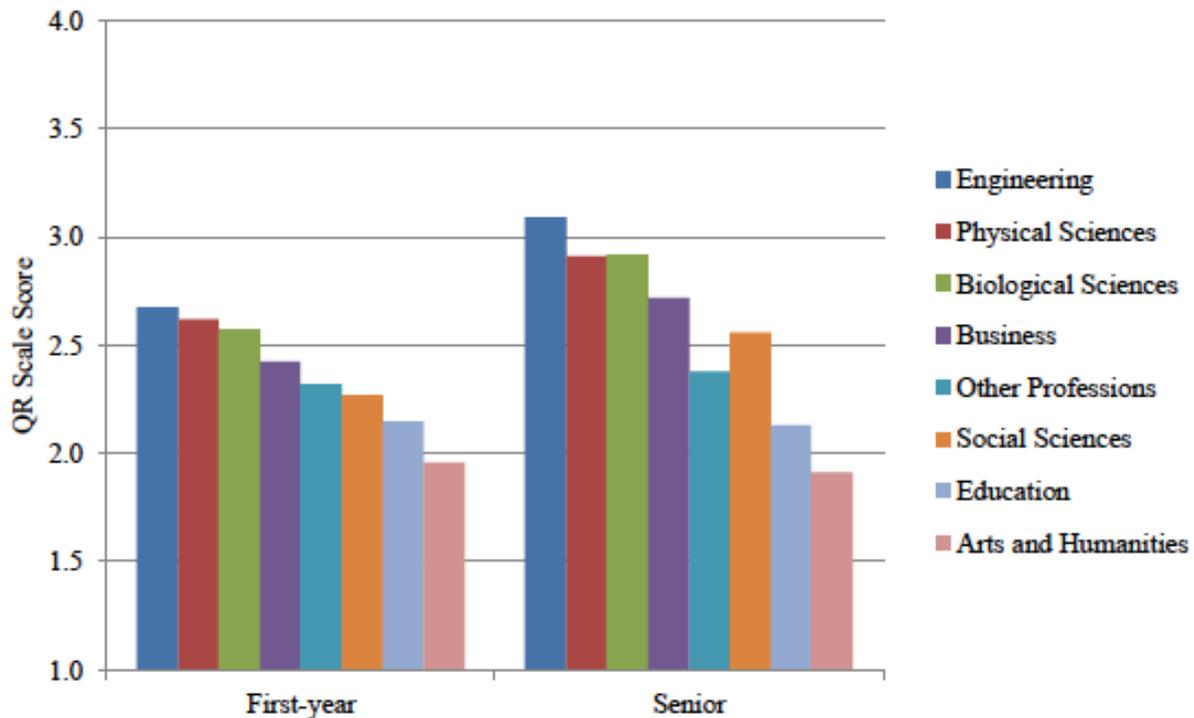
Challenges. A 2001 study by the Mathematical Association of America (MAA) summed up the challenges:

1. Most higher education students graduated without sufficient QR
2. Faculty in all disciplines needed professional development support to enhance QR in their courses
3. QR was not part of assessment activity
4. Education policy leaders were insufficiently aware of the increasing need for QR

While this study is more than a decade old, we may not be much further along today. QR is a complex outcome that requires immediate attention from faculty across the disciplines. Many institutions have embraced the core competencies of writing and communication, but far fewer attend to this equally critical outcome. In addition, there are special difficulties in reaching students. As Hughes-Hallett (2001) notes, they find it hard, especially when QR is taught in the context of the disciplines. She describes results from a study where students were given a quantitative problem to solve in the abstract and then in the context of a scientific problem. No scientific understanding was required to solve the problem, but students had trouble with the contextualized problem, in part because their perceptions of science or science phobia interfered.

One of the first decisions a campus must make when approaching QR learning is where in the curriculum students will be expected to gain these skills, and thus, where the faculty will both teach and measure it. A recent paper by Rocconi and colleagues (National Survey of Student Engagement, 2013) reports that students in STEM fields are more engaged in QR-related activities than those in non-STEM fields, with students in education and the humanities showing the least engagement (Figure 2). This may not be surprising, but it is illuminating, given that QR skills are important for *all* students. It is easy to assume that the responsibility for QR should rest with the mathematics portion of general education or mathematics faculty. But experts argue that QR goes beyond basic math skills, and that most math courses don't teach QR skills. There is a disciplinary context to the deep demonstration of QR skills by students that can most likely only be achieved by repeated exposure across the curriculum, along with culminating assessment in the major or a capstone experience. Faculty in mathematics departments may be best suited to take a leadership role in leading a campus-wide effort, but that effort must include faculty in other disciplines to have the broadest impact.

Figure 2. Average Frequency of QR Activities by Major and Class Level



Learning Outcomes for QR. As with any core competencies or higher-order intellectual skills, faculty and other educators should use “backward design” (Wiggins and McTighe, 1998) to define the desired outcomes and create appropriate assessments before designing learning experiences for students. The outcomes may be simple or complex, depending on the focus or the locus of QR in the curriculum, i.e., general education or the major or some other institution-level requirement. These outcomes may include the kinds of math skills required, the types of data students should be able to interpret, the methods to be used for problem-solving, the desired results of the application of these skills, and ability to clearly communicate findings. Other outcomes may include student attitudes toward accomplishing these kinds of tasks, or ability to make connections to learning in the major or across the curriculum. Steen (2004, p. 24) argues that there are three essential components to QR: 1) engagement with the real world (which may set it apart from traditional mathematics), 2) ability to apply quantitative thinking to unfamiliar contexts, and 3) adaptable reasoning, which is the ability to make judgments even in the “absence of sufficient information or in the face of inconsistent evidence.” How often in the real world do we have all the information we need to make a solid judgment? Rarely. Thus, we should be preparing our students to grapple with this kind of uncertainty.

Several universities have already developed outcomes for QR. One example of a comprehensive set of outcomes for graduating seniors at the University of Virginia is shown in Box 2. These outcomes are quite extensive but traverse the terrain of basic understanding of quantitative information and processes, using QR methods, communicating quantitative information and evaluating quantitative information. Another example is the Degree Qualifications Profile, which defines quantitative fluency, in terms of both *what* students should be able to do and at what *level of skill* or performance.

At the associate level, the student

- Presents accurate calculations and symbolic operations, and explains how such calculations and operations are used in either his or her specific field of study or in interpreting social and economic trends.

At the bachelor's level, the student

- Translates verbal problems into mathematical algorithms and constructs valid mathematical arguments using the accepted symbolic system of mathematical reasoning.
- Constructs, as appropriate to his or her major field (or another field), accurate and relevant calculations, estimates, risk analyses or quantitative evaluations of public information and presents them in papers, projects or multi-media events.

At the master's level:

- Students who are not seeking a degree in a quantitatively based field employ and apply mathematical, formal logic and/or statistical tools to problems appropriate to their field in a project, paper or performance.
- Students seeking a degree in a quantitatively based or quantitatively relevant field articulate and/or undertake multiple appropriate applications of quantitative methods, concepts and theories within their field of study.

Some universities have set out a program for mathematics across the curriculum (MATC), much like the writing across the curriculum (WAC) movement that swept the nation a decade or more ago. Dartmouth College has an MATC program that has helped faculty from mathematics and the humanities create nine integrated courses. Other institutions have built quantitative reasoning centers that host programs – workshops, tutoring, peer mentoring, etc. – to help students achieve QR skills. For example, Bowdoin College has created a Quantitative Reasoning Program that provides advising, study groups, tutoring and supplemental instruction in support of QR learning goals. The college is also developing a test for use in academic advising that will measure incoming students' QR skill levels. This test analyzes the following areas: Computation and Estimation, Probability and Statistics, Graphical Analysis and Common Functions, and Logic/Reasoning.

Box 2. University of Virginia Quantitative Reasoning Outcomes

A graduating fourth-year undergraduate at the University of Virginia will be able to:

- (1) Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.
- (2) Communicate mathematical information symbolically, visually, numerically, and verbally.
- (3) Use arithmetical, algebraic, and geometric methods to solve problems.
- (4) Estimate and check answers to mathematical problems in order to determine reasonableness.
- (5) Solve word problems using quantitative techniques and interpret the results.
- (6) Apply mathematical/statistical techniques and logical reasoning to produce predictions, identify optima, and make inferences based on a given set of data or quantitative information.
- (7) Judge the soundness and accuracy of conclusions derived from quantitative information, recognizing that mathematical and statistical methods have limits and discriminating between association and causation.
- (8) Solve multi-step problems.
- (9) Apply statistics to evaluate claims and current literature.
- (10) Demonstrate an understanding of the fundamental issues of statistical inference, including measurement and sampling.

Assessment. Many different approaches to assessing QR have been developed, ranging from direct to indirect measures of learning. Available tools include ready-to-use instruments and rubrics as well as survey and interview questions that assess attitudes toward mathematics in real world contexts. Examples are available on the national organizations' websites described in the next section, but I will describe three specific tools below.

The Center for Assessment and Research Studies (CARS) at James Madison University has developed the Quantitative Reasoning Test (Sundre, 2008). This instrument has been administered at over 50 universities to more than 20,000 students. It is a 25-minute multiple-choice exam that focuses on two key outcomes. These are ability of students to:

- use graphical, symbolic, and numerical methods to analyze, organize and interpret natural phenomenon; and
- discriminate between association and causation, and identify the types of evidence used to establish causation.

AAC&U's VALUE (Valid Assessment of Learning in Undergraduate Education) project has published a rubric for assessing quantitative literacy with six criteria: interpretation, representation, calculation, application/analysis, assumptions and communication. Each of these criteria is described in detail, and the performance rating system ranges from the highest level (4, or "capstone") through mid-range "milestones" (3, 2) to the beginner level (1). The rubric may be downloaded from the web; as with all its VALUE rubrics, AAC&U encourages institutions to modify this one to reflect local emphases. Dingman and Madison (2011) have developed a modified rubric based on AAC&U's prototype. Grawe et al. (2010) have published a

rubric for assessing QR skills within the context of writing assignments.

With support from the National Science Foundation, the Dartmouth College MATC project has developed a 35-question attitude survey to explore how students feel about the subject of math and their comfort with using it. The project has also have developed an interview protocol for focus groups with students. This protocol not only addresses attitudes but the issue of integration of mathematics with the humanities in the course(s) students took, as well as their possible longer-term use of the skills they gained in the course.

It is important for universities to establish standards of performance that students should reach at or near graduation with respect to QR. This is a key part of the new WASC requirement for reporting on students' achievement in core competencies. Direct assessment of QR skills could be used (e.g., evaluation of e-portfolio collections of student work), along with other means, to determine the actual level of performance. Faculty could then apply their findings regarding performance to identify programmatic changes that need to be made to make improvements.

Learning, Teaching, and Faculty Development: There is no single pedagogy for QR, although problem-based or inquiry-focused learning approaches may be the most appropriate. Having students analyze data that is relevant to the course or discipline is a good place to start. News media are ready sources of data that can be used in classes. For example, Dingman and Madison (2011) take a student-centered approach to a general education course that moves the instructor into a moderator role, working with students on problems that stem from their interests and current events. Texts come primarily from the Internet. Grawe (2012) describes several resources for teaching and measuring QR, such as those provided by three national organizations, the Mathematical Association of America (MAA), Project Kaleidoscope (PKAL), and the National Numeracy Network (NNN). Their websites offer a variety of curricular materials, along with assessment resources. NNN also publishes a national journal, *Numeracy*, that “supports education at all levels that integrates quantitative skills across disciplines.” This journal publishes the latest developments in QR education. In Volume 6, Issue 2, the theme is financial literacy, with nine articles describing a variety of education approaches, curricular materials, and assessment methods.

This type of teaching has implications for faculty development: not only do faculty members need to be comfortable with the content of QR, but they also need to become skilled in adapting real-world materials to instruction and using more active, less lecture-focused instructional methods. As the writing across the curriculum movement has learned, one of the best ways to help faculty members incorporate QR learning into their courses may be workshops sponsored by the faculty development center. These workshops can help faculty members gain confidence and skills in generating assignments and developing classroom activities for QR in disciplines that do not routinely use mathematics, such as in the arts and humanities. Faculty in these disciplines may also have math anxiety, much as faculty in the sciences and engineering may have anxiety about teaching and grading writing.

Conclusion. Hughes-Hallett (2001) asserts that what we need is a partnership among departments to help students achieve QR learning outcomes. She argues that this partnership must involve high schools, community colleges, colleges and universities. Before we get to that point, however, institutions need support as they address for themselves the complex issues regarding the development of QR outcomes, learning experiences, assessments, and faculty development programs. This WASC-sponsored workshop will explore the following themes through workshop and mentoring sessions delivered by experts in the field:

1. Defining Quantitative Reasoning
2. Quantitative Reasoning in General Education and across the Curriculum
3. Assessing Quantitative Reasoning
4. Faculty Development in Quantitative Reasoning
5. Supporting Students' Development of Quantitative Reasoning Skills

References & Resources:

AAC&U VALUE Rubric on Quantitative Literacy:

http://www.aacu.org/value/rubrics/Quantitative_Literacy.cfm.

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New York: David McKay Co Inc.

Bowdoin College's Quantitative Skills Program: <http://www.bowdoin.edu/gr-program/index.shtml>.

Dartmouth College's Mathematics Across the Curriculum:

<http://www.dartmouth.edu/~matc/Evaluation/humeval.pdf>

Dingman, Shannon W. and Bernard L. Madison. 2011. Twenty-First-Century Quantitative Education: Beyond Content. *Peer Review* 13(3): 15-18.

Grawe, Nathan D. 2012. Achieving a Quantitative Literate Citizenry: Resources and Community to Support National Change. *Liberal Education* 98 (2): 30-35.

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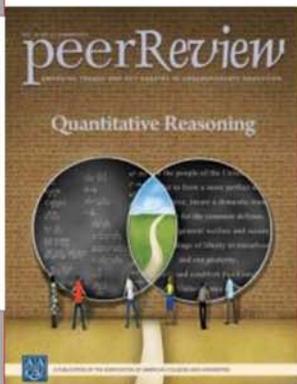
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Peer Review

Quantitative Reasoning: The Next "Across the Curriculum" Movement

By: [Susan Elrod](#)

We live in an age where vast amounts of information can be accessed on the Internet. Much of this information is quantitative in nature and students (and adults) must be equipped to analyze the information as they sift through the data to make decisions in their everyday lives. And, as "big data" analyses move from pure research applications to business, education, health, and government settings where our graduates will be working, this imperative becomes more critical. Even in our own institutions of higher education, we are crunching large data sets of student information to monitor and predict student performance and success. All of these situations require strong quantitative reasoning skills.

What Is Quantitative Reasoning?

Quantitative reasoning. Quantitative literacy. Quantitative fluency. Numeracy. These are often-used terms when discussing a key learning outcome for undergraduate education. Here are a few high-profile examples of calls for prioritizing such quantitative skills:

- Quantitative literacy is one of the LEAP (Liberal Education for America's Promise) Essential Learning Outcomes (ELOs) developed by the Association of American Colleges & Universities (AAC&U), one of a number of practical intellectual skills, including inquiry and analysis, critical and creative thinking, written and oral communication, information literacy and teamwork, and problem solving.
- The Lumina Foundation's Degree Qualifications Profile (DQP) calls this skill quantitative fluency and places it, like LEAP, among several important intellectual skills all students should attain, including analytic inquiry, information literacy, engaging diverse perspectives, and communication fluency.
- The Western Association of Schools and Colleges (WASC) Senior College and University Commission has recently shifted its focus to five core competencies—writing, oral communication, quantitative reasoning, critical thinking, and information literacy—in its revised institutional review process.

The ability to think quantitatively clearly plays a central role in undergraduate education. But what do terms like quantitative reasoning, quantitative literacy, and quantitative fluency really mean for student learning, the curriculum, program development, faculty development, or accreditation? Why is it such an important outcome? How do we teach and measure it? Who is responsible for ensuring that students achieve this

competency?

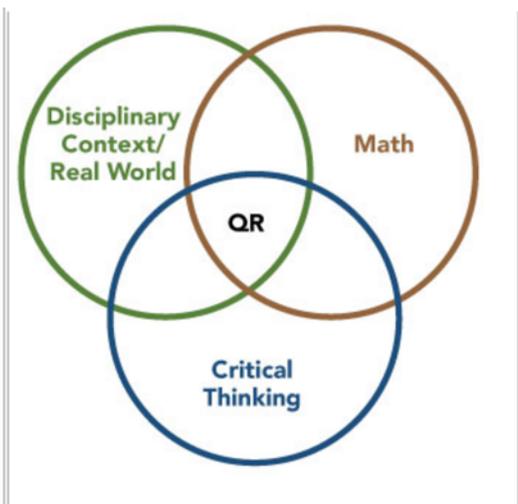
By one definition, quantitative reasoning (QR) is the application of basic mathematics skills, such as algebra, to the analysis and interpretation of real-world quantitative information in the context of a discipline or an interdisciplinary problem to draw conclusions that are relevant to students in their daily lives. It is not just mathematics. Carleton College, for example, views QR as "the habit of mind to consider the power and limitations of quantitative evidence in the evaluation, construction, and communication of arguments in public, professional, and personal life." The term numeracy is also used in conjunction with these skills.

Ultimately, QR requires students to think critically and apply basic mathematics and statistics skills to interpret data, draw conclusions, and solve problems within a disciplinary or interdisciplinary context (fig. 1). Indeed, it requires the kind of mathematical and statistical skills that should be developed in high school, so all college students should have the basic skills required to achieve this broader, more ambitious college-level outcome. It is a competency of integration and application, both of which are intellectual capacities up near the top of the cognitive skills taxonomy originally described by Bloom (1956). Assignments that develop QR can also elicit demonstration of achievement of other key outcomes like writing and/or oral communication as well as information literacy aspects. While many espouse the importance of QR, higher education faculty and administrators need to expand the ways we provide students with learning opportunities to understand and practice this set of skills.

Why QR Should Be Taught across the Curriculum and in Interdisciplinary Contexts

The development of intellectual skills is paramount for undergraduate students. AAC&U (2007) states that intellectual and practical skills should be "practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance." The DQP provides another lens through which to view these skills, stating that "students hone and integrate" these skills across the curriculum when dealing with problems in their major field of study, but also with "broad, integrative problem-solving challenges." Thus QR appears to be much more than a general education learning outcome; it must be accomplished within the major, but also beyond it. QR is located at the intersection of critical thinking, basic mathematics skills, and the disciplines or real-world contexts for learning (fig. 1).

Figure 1. QR within the Undergraduate Curriculum



Deborah Hughes-Hallett (2001) argues that QR must be taught in the context of the disciplines because a critical component of the outcome is the ability to identify quantitative relationships in a range of contexts. She also argues that the very nature of QR is interdisciplinary because it involves contextual problem solving in real-world situations. Yet general education is where many campuses locate the teaching, learning, and assessment of core competencies like QR. One of the first decisions a campus must make when approaching QR learning is where in the curriculum students will be expected to gain these skills, and thus, where the faculty will both teach and measure it.

Examples of QR in everyday life abound and can be drawn upon to teach QR in the context of virtually any discipline. They can be found in areas such as health, economics, politics, science, engineering, social science, and even the arts. For example, virtually all parents face the vaccination question early in the life of their children. Parents might ask questions like, "What are the risks associated with vaccinating my child? What are the benefits?" In order to answer these questions, they must take into account quantitative information, such as disease occurrence rates in populations over time, or numbers of cases of complications with certain vaccine preparations. In today's information age, the Internet is the most readily available source of information, so students (and adults) must be able to discern reliable versus non-reliable sources.

Returning to our vaccination example, there is rampant misinformation online about a connection between autism and vaccinations that must be recognized as such when parents formulate their decisions. Making judgments based on political polling data, understanding the national debt, interpreting nutrition facts, evaluating medical treatment or screening options, making investment decisions, and even purchasing decisions—these are all everyday challenges that require us to use QR skills. However, according to a 2003 survey by the National Assessment of Adult Literacy, only 13 percent of adults are deemed proficient in quantitative literacy; 33 percent perform at intermediate levels, 33 percent at basic levels, and 22 percent are below basic.

Larger societal issues, such as climate change, also require the application of QR skills—and the closing of a widening gap between those who have these skills and those who do not. Issues like these are politically contentious, beyond the practical implications for everyday life and decision making (should I buy a hybrid car? Should I buy carbon credits?). The "hockey stick"

graph of rising CO₂ levels made worldwide news as politicians debated the science behind climate change, or global warming as it was known in the past decade.

Jon D. Miller is a political scientist at University of Michigan who has been studying the civic scientific literacy of US adults. In surveys that ask basic factual scientific questions, he finds that less than 30 percent are scientifically literate (Miller 2010).

Anthony Carnevale, director of research at the Center on Education and the Workforce at Georgetown University, argues that “the remedy for the widening gulf between those who are literate in mathematics and science and those who are not is democratization—making mathematics and science more accessible and responsive...to the needs of all citizens” (Steen 2004, 65). One way to achieve this literacy may be through a more intensive focus on quantitative reasoning in college. There are implications for all levels of education, preschool through college, but our focus here is on the undergraduate curriculum.

One of the primary misconceptions regarding QR is that it is already taught in mathematics classes. However, QR is different from math. QR utilizes basic mathematics skills in the service of carrying out complex reasoning and decision-making processes. It is less about the how to perform the calculation and more about the meaning of the calculation results. Figure 2 contrasts math and QR to highlight the differences between them (Steen 2004).

Figure 2. Math versus Quantitative Reasoning

Traditional Math	Quantitative Reasoning
Abstract, deductive reasoning	Practical, robust habit of mind
Employed in professions such as sciences, technology, and engineering	Employed in every aspect of an alert, informed life
Rises above context	Anchored in context
Objects of study are ideals	Objects of study are data
Serves primarily professional purposes	Is essential for all graduates' personal and civic responsibilities

A recent paper by Rocconi and colleagues (2013) reports that students in STEM fields are more engaged in QR-related activities than those in non-STEM fields, with students in education and the humanities showing the least engagement. This may not be surprising, but it is illuminating, given that QR skills are important for *all* students. It is easy to assume that the responsibility for QR should rest with the mathematics portion of general education or mathematics faculty. But experts argue that QR goes beyond basic math skills, and that most math courses don't teach QR skills. There is a disciplinary context to the deep demonstration of QR skills by students that can most likely only be achieved by repeated exposure across the curriculum, along with culminating assessment in the major or a capstone experience. Faculty in mathematics departments may be best suited to take a leadership role in leading a campus-wide effort, but that effort must include faculty in other disciplines to have the broadest impact.

How Do We Get There?

A 2001 study by the Mathematical Association of America summed up the challenges:

1. Most higher education students graduated without sufficient QR skills

2. Faculty in all disciplines needed professional development support to enhance QR in their courses
3. QR was not part of assessment activity
4. Education policy leaders were insufficiently aware of the increasing need for QR

While this study is more than a decade old, we may not be much further along today. QR is a complex outcome that requires immediate attention from faculty across the disciplines. Many institutions have embraced the core competencies of writing and communication, but far fewer attend to this equally critical outcome. In addition, there are special difficulties in reaching students. As Hughes-Hallett (2001) notes, they find it hard, especially when QR is taught in the context of the disciplines. She describes results from a study where students were given a quantitative problem to solve in the abstract and then in the context of a scientific problem. No scientific understanding was required to solve the problem, but students had trouble with the contextualized problem, in part because their perceptions of science or science phobia interfered. Other challenges might be related to creating awareness and buy-in across the campus for establishing and measuring QR outcomes. Campuses are already measuring many outcomes as accreditors ask for more specific and deliberate outcomes assessment (such as WASC's new required attention to five core competencies discussed above). Many campuses have yet to define this outcome. Thus, an initial hurdle may be just starting the conversation about what QR means.

Learning Outcomes for Quantitative Reasoning

As with any core competency or higher-order intellectual skill, using the "backward design" process (Wiggins and McTighe 1998) to define the desired outcomes and create appropriate assessments before designing learning experiences for students is useful. The outcomes may be simple or complex, depending on the focus or the locus of QR in the curriculum (i.e., general education or the major or some other institution-level requirement). These outcomes may include the kinds of math skills required, the types of data students should be able to interpret, the methods to be used for problem solving, the desired results of the application of these skills, and the ability to clearly communicate findings. Other outcomes may include student attitudes toward accomplishing these kinds of tasks, or ability to make connections to learning in the major or across the curriculum. Steen (2004b, 24) argues that there are three essential components to QR: (1) engagement with the real world (which may set it apart from traditional mathematics), (2) ability to apply quantitative thinking to unfamiliar contexts, and (3) adaptable reasoning, which is the ability to make judgments even in the "absence of sufficient information or in the face of inconsistent evidence." How often in the real world do we have all the information we need to make a solid judgment? Rarely. Thus, we should be preparing our students to grapple with that kind of uncertainty.

Several universities have already developed outcomes for QR. One example of a comprehensive set of outcomes for graduating seniors at the University of Virginia is shown in fig. 3. These outcomes are quite extensive but traverse the terrain of basic understanding of quantitative information and processes, using QR methods, communicating quantitative information, and evaluating quantitative information.

Figure 3. University of Virginia Quantitative Reasoning Outcomes

A graduating fourth-year undergraduate at the University of Virginia will be able to

Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.

1. Communicate mathematical information symbolically, visually, numerically, and verbally.
2. Use arithmetical, algebraic, and geometric methods to solve problems.
3. Estimate and check answers to mathematical problems in order to determine reasonableness.
4. Solve word problems using quantitative techniques and interpret the results.
5. Apply mathematical/statistical techniques and logical reasoning to produce predictions, identify optima, and make inferences based on a given set of data or quantitative information.
6. Judge the soundness and accuracy of conclusions derived from quantitative information, recognizing that mathematical and statistical methods have limits and discriminating between association and causation.
7. Solve multistep problems.
8. Apply statistics to evaluate claims and current literature.
9. Demonstrate an understanding of the fundamental issues of statistical inference, including measurement and sampling.

Another example is the DQP, which defines quantitative fluency, in terms of *both* what students should be able to do and at what *level of skill* or performance.

At the associate level, the student

- Presents accurate calculations and symbolic operations, and explains how such calculations and operations are used in either his or her specific field of study or in interpreting social and economic trends.

At the bachelor's level, the student

- Constructs, as appropriate to his or her major field (or another field), accurate and relevant calculations, estimates, risk analyses, or quantitative evaluations of public information and presents them in papers, projects, or multimedia events.

At the master's level:

- Students who are not seeking a degree in a quantitatively based field employ and apply mathematical, formal logic, and/or statistical tools to problems appropriate to their field in a project, paper, or performance.
- Students seeking a degree in a quantitative-based or quantitatively relevant field articulate and/or undertake multiple appropriate applications of quantitative methods, concepts, and theories within their field of study.

A key component of WASC's new core competency requirement is that colleges and universities establish standards of performance that students should reach at or near graduation. This means that standards regarding how well or at what level

students will be expected to perform must be established.

Assessment

Many different approaches to assessing QR have been developed, ranging from direct to indirect measures of learning. Available tools include ready-to-use instruments and rubrics as well as survey and interview questions that assess attitudes toward mathematics in real-world contexts. Examples are available on the national organizations' websites described in the next section, but I will describe three specific tools below.

The Center for Assessment and Research Studies at James Madison University has developed the Quantitative Reasoning Test (Sundre 2008). This instrument has been administered at over fifty universities to more than 20,000 students. It is a twenty-five-minute multiple-choice exam that focuses on two key outcomes. These are ability of students to

- use graphical, symbolic, and numerical methods to analyze, organize, and interpret natural phenomenon; and
- discriminate between association and causation, and identify the types of evidence used to establish causation.

With funding from the National Science Foundation, Eric Gaze and colleagues have developed another tool, the quantitative reasoning and literacy test (QRLA) for measuring students' QR skill levels. This twenty-three-item test analyzes the following areas: computation and estimation, probability and statistics, graphical analysis and common functions, and logic/reasoning (For details, see <http://serc.carleton.edu/qlra/index.html>).

AAC&U's VALUE (Valid Assessment of Learning in Undergraduate Education) project has published a rubric for assessing quantitative literacy with six criteria: interpretation, representation, calculation, application/analysis, assumptions, and communication (see page 2). Each of these criteria is described in detail, and the performance rating system ranges from the highest level (4 or "capstone") through mid-range "milestones" (3, 2) to the beginner level (1). The rubric may be downloaded from the web; as with all its VALUE rubrics, AAC&U encourages institutions to modify this one to reflect local emphases. Dingman and Madison (2011) have developed a modified rubric based on AAC&U's prototype. Grawe et al. (2010) have published a rubric for assessing QR skills within the context of writing assignments.

One concern that faculty may have regarding QR assessment is that it may be perceived as yet another outcome to assess, on top of all of the others, and campuses may be thinking that they need to create a whole new assessment strategy for this outcome. Workload issues are real with respect to assessment because of the increased demand over the past few years by accreditors and the public. In order to lessen the workload, campuses might consider how QR can be added to existing assessment strategies. For example, many programs have capstone courses with signature assignments in which writing and critical thinking are already assessed using rubrics (or a single rubric). Those assignments and accompanying rubrics could be modified to add a QR component.

QR Programs and Centers

Some universities have set up programs for mathematics or QR across the curriculum, much like the writing across the

curriculum movement that swept the nation a decade or more ago. Dartmouth College's MATC program has helped faculty from mathematics and the humanities create nine integrated courses. Other institutions have built QR centers that host programs—workshops, tutoring, peer mentoring, etc.—to help students achieve QR skills. For example, Bowdoin College has created a QR program that provides advising, study groups, tutoring, and supplemental instruction in support of QR learning goals.

Learning, Teaching, and Faculty Development

There is no single pedagogy for QR, although problem-based or inquiry-focused learning approaches may be the most appropriate. Having students analyze data that is relevant to the course or discipline is a good place to start. News media are ready sources of data that can be used in classes. For example, Dingman and Madison (2011) take a student-centered approach to a general education course that moves the instructor into a moderator role, working with students on problems that stem from their interests and current events. Texts come primarily from the Internet. Grawe (2012) describes several resources for teaching and measuring QR, such as those provided by three national organizations, the Mathematical Association of America, Project Kaleidoscope, and the National Numeracy Network. Other resources are available on the Science Education Resource Center website. These organizations' websites offer a variety of curricular materials, along with assessment resources. NNN also publishes a national journal, *Numeracy*, that "supports education at all levels that integrates quantitative skills across disciplines."

This type of teaching has implications for faculty development: not only do faculty members need to be comfortable with the content of QR, but they also need to become skilled in adapting real-world materials to instruction and using more active, less lecture-focused instructional methods. As the writing across the curriculum movement has learned, one of the best ways to help faculty members incorporate QR learning into their courses may be workshops sponsored by the faculty development center. These workshops can help faculty members gain confidence and skills in generating assignments and developing classroom activities for QR in disciplines that do not routinely use mathematics, such as in the arts and humanities. Faculty in these disciplines may also have math anxiety, much as faculty in the sciences and engineering may have anxiety about teaching and grading writing.

Conclusion

Hughes-Hallett (2001) asserts that what we need is a partnership among departments to help students achieve QR learning outcomes. She argues that this partnership must involve high schools, community colleges, colleges, and universities. Like the writing across the curriculum programs of the past decade, QR deserves the same institutional attention and focus.

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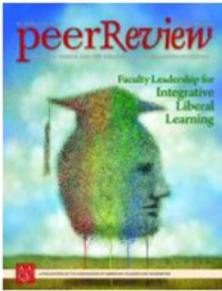
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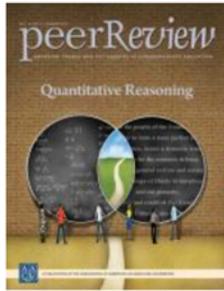
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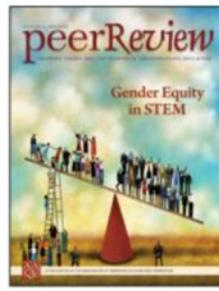
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Disciplinary Samples

<http://assessment.voices.wooster.edu/disciplines-2/>

<http://www.assessmentupdate.com/sample-articles/disciplinary-resources-assessment-liberal-arts.aspx>

<http://assessment.georgetown.edu/wp-content/uploads/Disciplinary-Associations-Assessment-Resources.pdf>

Banta, T.W., Jones, E.A., and Black, K.E. (2009). *Designing effective assessment: Principles and profiles of good practice*. San Francisco: Jossey-Bass. (See Chapter 6: Undergraduate Academic Major Profiles)

Online Resources for Assessment and Quantitative Reasoning

AAC&U's Assessment Resource page: <http://www.aacu.org/resources/assessment/index.cfm>

AAC&U VALUE Rubric on Quantitative Literacy: <http://www.aacu.org/value/rubrics/QuantitativeLiteracy.cfm>.

Bowdoin College's Quantitative Skills Program: <http://www.bowdoin.edu/qr-program/index.shtml>.

Dartmouth College's Mathematics across the Curriculum:
<http://www.dartmouth.edu/~matc/Evaluation/humeval.pdf>

National Numeracy Network (NNN): <http://serc.carleton.edu/nnn/index.html>.

Numeracy journal: <http://scholarcommons.usf.edu/numeracy/>

Mathematics Association of America: <http://www.maa.org/programs/faculty-and-departments/curriculum-department-guidelines-recommendations/quantitative-literacy>

Mathematical Literacy: <https://sites.google.com/a/dpi.wi.gov/disciplinary-literacy-in-mathematics/>

Project Kaleidoscope (PKAL): <http://aacu.org/pkal/resources/teaching/quantitative.cfm>

Quantitative Learning and Reasoning Assessment instrument: <http://serc.carleton.edu/qlra/index.html>

Quantitative Reasoning Test: <http://www.madisonassessment.com/assessment-testing/quantitative-reasoning-test/> Science Education Resource Center's Teaching with Data Website:
<http://serc.carleton.edu/sp/library/twd/index.html>

Science Education Resource Center's Teaching Quantitative Reasoning Website:
<http://serc.carleton.edu/sp/library/qr/index.html>

SERC websites on Assessment of QR: http://serc.carleton.edu/NICHE/ex_qr_assessment.html.

RESOURCES

Critical Thinking & Information Literacy

Teaching and Assessing for Thinking: A Classroom, Program and Institutional Commitment¹

Carol Ann Gittens
Santa Clara University

Consider the following claim, “*College instructors **want** to develop their students’ critically thinking skills and nurture students’ desire to use critical thinking to solve problems or make decisions.*” Do you agree with this statement? Why or why not? Take a minute to consider and formulate your response to this question. Good. What might your colleagues back on campus say? How about your students, how might they answer? I urge you to try it and see...this could be the beginning of a great conversation! But for now, read on...

I am going to assume that upon consideration, you have decided to agree with the claim. What reasons might we give for a decision to agree? Well some of you might have said something like the following: It’s why we do what we do. We want our student to be able to successfully navigate the information-dense world that we all live in today. We want our students to take what they have learned in prior courses and successfully apply that learning to subsequent courses. We want our students to evaluate the validity, reliability and relevance of information and use that information to formulate arguments that are based on sound reasoning. We want to engage our students in analyzing underlying causes, examining influencing factors, and anticipating likely consequences of human decisions and behaviors that have shaped our collective histories and affect our

¹ This manuscript was prepared for the WASC Core Competencies Workshop on Critical Thinking and Information Literacy, October 11-12, 2012.

futures. We want our graduates to leave us with the cognitive skills and dispositions and literacies that will transform them into engaged citizens and effective leaders of tomorrow. We want them to be good thinkers in their academic, social, personal, professional and social lives – in other words, we want this for our students not only because we value college success but life success as well². Critical thinking is about real life. This essay will begin with a focus on teaching *for* thinking at the college level to and then move into a discussion of assessment strategies that can be employed at the classroom, program, and institutional levels to gather valid and reliable data on your students' thinking skills and habits of mind.

In the *Preface* to their text book *THINK: Critically* (2013) Facione and Gittens argue that “it is more important that a person use all of his or her strengths as a critical thinker to try and make the best judgments possible than the person memorize a lot of vocabulary or theory about critical thinking.”³ A distinction is being made here between teaching *for* thinking and teaching *about* thinking. To strengthen students' critical thinking skills and nurture the courageous desire to seek truth by following reasons and evidence wherever they lead, it is not sufficient to learn about critical thinking as if it were a set of steps or facts of principles to be memorized.



To become stronger critical thinkers, students need frequent opportunities to actively engage in thinking critically.

² What others reasons did you come up with? Please come up to me during this workshop and share your ideas. Or send me an email with your reactions to any of the issues raised in this essay.

³³ Chapters 1 and 2 from *THINK Critically* 2e (Facione & Gittens, 2013) have been reprinted in the WASC Critical Thinking and Information Literacy Resource Guide with permission from Pearson Education, Inc.

Teaching for thinking means you structure your class so that students use their critical thinking constantly.

Particularly important is the opportunity for students to interpret, draw inferences, evaluate, and engage such dispositions as truth-seeking, open mindedness, and inquisitiveness to novel contexts, themes, problems, and ideas, and consider complex themes and problems that have multiple perspectives and imperfect solutions. Becoming a strong critical thinker takes practice. It also takes frequent, constructive. Teaching and assessment are two essential components of a holistic strategy to promote student learning and cognitive skills development. Students who receive formative feedback on the quality or strength of their thinking as well as receive acknowledgement of the expression of critical thinking habits of mind will experience an augmentation and validation of their self-monitoring, self-correction, and self-confidence.

Active Learning to Promote Critical Thinking: Best Practices in the Classroom

Critical thinking pedagogy—teaching *for* thinking—fully embraces the principles of active learning. Teaching for thinking is “hands on” and is about practicing the use of one’s

To teach *for* thinking is to...

- Exercise students’ critical thinking skills of interpretation, analysis, inference, evaluation, explanation, and reflective self-monitoring independently or in collaboration with others.
- Acknowledge and reward truth-seeking, open mindedness, and inquisitiveness – especially about themes where students may already hold strong beliefs.
- Engage in activities that invite students to perform purposeful, reflective judgments about authentic scenarios and real-life situations.

critical thinking skills and habits of mind. When teaching for thinking, an instructor provides numerous opportunities for students to actively apply their critical thinking skills and nurture their critical thinking dispositions / habits of mind. When teaching for thinking, students are asked to engage reflectively with novel contexts, multiple perspectives, ideologically challenging themes, and authentic or real-life scenarios.

Constant engagement with complex ideas encourages students to develop dispositions of truth-seeking, open-mindedness, and objectivity. When teaching for thinking, students are asked to reflect independently or think critically in groups, for this is how they employ their thinking skills and habits of mind in real life. The active learning features of a teaching-for-thinking approach reinforce students' inquisitiveness, reflection, self-monitoring, and other critical thinking habits of mind. Repetitive practice, alone and in groups, accompanied by opportunities to receive supportive formative feedback will bolster students' growth toward being strong critical thinkers.

Active learning is often contrasted with teacher-centered, passive learning such as the stereotypic "traditional lecture" strategies than many of us experienced during our own college days. Passive learning can be characterized as a low level of student involvement, effort, or motivation in the learning experience. Transmission of course content is unidirectional from the knowledgeable instructor to the dependent student. The active learning model of teaching, on the other hand, assumes that the student is a partner in the learning process. An active learning classroom is a student-centered classroom. As such, students influence the pace of learning and the selection of activities and course materials. Active learning is collaborative and empowering. Students share the responsibility for their own learning and contribute to the learning experience of others.

Active learning casts the instructor as a resource, guide, and motivator during the learning process. The active learner invests considerable energy, enthusiasm, and effort into the learning experience. Because of this active involvement, the learning is self-

Reaping the Benefits of Active Learning

- Model the positive critical thinking habits of mind and the explicit application of the core critical thinking skills to make well-reasoned, fair-minded judgment.
- Encourage students to view your classroom as a safe space for asking questions, sharing perspectives, and interacting meaningfully with others.
- Insist upon nothing less than the full and thoughtful engagement of all students so that they may be active agents in their own learning.
- Provide opportunities to engage with thoughtful questions that seek explanation, rationale, interpretation, clarification, definition, and application of the course content.

reinforcing, which increases retention and transfer of what is learned to other courses and contexts. The underlying premise is the constructivist conceptualization of learning. Through active learning, students actively construct meaning from previous knowledge and skills and the new knowledge and skills they acquire. To facilitate this process, instructors provide students multiple opportunities to connect what they learn to prior knowledge and to apply what they learn to authentic or real-life contexts. Furthermore, active learning strategies incorporate substantial

opportunities for collaborative or cooperative learning.

It is important to note that active learning is more than giving students a choice of topics on a paper assignment, requiring student presentations, or asking a question and calling on a student to provide an answer. Active learning requires planning and commitment on the part of the instructor to put the student at the center of the learning experience and to conduct the course in a manner that maximizes the student's multiple and frequent opportunities to apply and reflect on the knowledge, skills, and values that are central elements of the course.

Active learning means that students have the opportunity to answer questions and to ask them as well. To support this, the classroom environment should be collaborative and non-confrontational. While this can be challenging when the class themes represent ideas or values that are linked to deeply held beliefs regarding a person's religion, culture, politics, upbringing, or other personal epistemologies, the instructor of an active learning classroom promotes interactions that are constructive and meant to develop and enhance one another's learning and understanding rather than to attack or show disrespect. This includes having the students feel comfortable and able to challenge, assert, evaluate, and react to the ideas being shared by peers *and the instructor*. Thus, a reflective discourse is actively encouraged by all and a mutual respect is practiced by all.

Other ways to use active learning to promote the development of students' critical thinking is to assure that ideas from the course are applied to novel topics and contexts. By practicing with thinking through questions and framing problems in novel context, the application of one's learning reinforces the development of skills, deepens understanding, and encourages transfer. This is accomplished by spending class time on discussion.

Interactions with others aid in clarifying ideas, experiencing multiple and diverse perspectives, comparing findings, explaining one's reasoning, and developing confidence in one's self as a learner. Remember that in the active learning paradigm, the instructor is a resource, guide, and mentor to students. If we let go of the idea that it is best to use class time to "cover" the material, we can imagine what are often more effective pedagogies, such as encouraging students to analyze, evaluate, research, apply, dramatize, debate, deliberate, collaborate, judge, decide, reflect, and engage with real-life examples.

Critical Thinking "How To's":

An Active Learning Repertoire

In 1987 Robert Sternberg published an essay in *Phi Delta Kappan* entitled "Teaching critical thinking: 8 easy ways to fail before you begin" in which he laid out eight powerful myths that many educators hold about critical thinking instruction that can doom us to failure if we cannot realize how misguided they are. Based on my experiences as an higher education consultant in the areas of critical thinking I can say unequivocally that many if not all of these myths about teaching critical thinking are still espoused among segments of the faculty on campuses all across the country. As I write this essay, the 2012 London Olympic Games is on my television screen. Much like the Olympic games, you will want to experience Sternberg's discussion of the eight teaching myths about critical thinking first-hand, but I will issue the following "spoiler alert" as I am about to share two of my favorites⁴ from Sternberg's list. They are "Critical thinking

⁴ Sternberg's eight ways to fail at teaching critical thinking are worthy of reflection and discussion. I encourage you to get a copy of this essay and share it among your colleagues.

is the students' job and only the students' job", and "Class discussion is primarily a means to an end". Did that pique your interest? I hope so! This article is a must-read for any educator who is serious about nurturing his or her students' critical thinking skills and critical thinking habits of mind.

I feel I would be remiss if I did not include some practical tips for how to promote critical thinking, so let's turn our attention there. The strategies I am sharing here are applicable to curricular and co-curricular activities, as well as assessments conducted at the course, program or institutional level. A few have been highlighted in the textbox above, but there are others that can be added to your repertoire. As you read through the following list, think about how many you already incorporate into your teaching and assessment endeavors and consider how you might incorporate some of the others.

- Pose thoughtful or insightful questions and intentionally allow 10–15 seconds of silence to elapse before calling on students to respond⁵. Cognitive science research has shown that a pause of this length is necessary for the human brain to sufficiently process a question and formulate a reasonable response.
- Work from the "bottom up" going from example to theory. Discuss real life examples, case studies or examples from the assigned readings first, and then draw out the concepts they teach. This technique practices students' inductive reasoning skills and promotes active engagement and inquisitiveness.
- Use critical thinking vocabulary when posing questions in discussion and on exams to reinforce conceptual understanding and promote recognition of

⁵ When I was a new faculty member I used to count to 10 in my head to be sure I waited and it calmed my nerves in the silence – try it! ☺

reasoning. Use phrases that reference critical thinking skills and habits of mind such as: “What is the reason for that claim?” “How would you interpret the statement (or graphic, or data table),” “What inferences can be reasonably drawn from these facts?” and “Let’s be systematic in our analysis.” ***Before reading on, write or say 1-2 examples of thinking vocabulary infused questions specifically geared toward your course, practicum setting, or discipline.*

- When giving oral or written feedback, acknowledge students’ use of critical thinking to promote their self-awareness and recognition of reasoning (don’t forget to use the critical thinking vocabulary!). For example, use phrases such as: “The claim you are making,” “The inquisitiveness of this group was evident when,” “I agree with your interpretation of,” and “In your analysis of.”
- Praise students’ display of critical thinking habits of mind such as inquisitiveness, cognitive maturity, and truth-seeking. Use phrases such as “I appreciate your fair-mindedly presented of that issue”, or “I love seeing your eagerness to learning more about these new ideas” or “I value your decision to seek more information before formulating a position on this unfamiliar topic”.
- Actively discourage sloppy, misleading, and imprecise assessment prompts or expressions such as: “How do you feel about that?” and “What is your view of this?” and even “What did you think of this?” This admonition applies to us when we are asking questions of our students and it applies to our students when they are engaging in classroom dialogue – encourage them to use strong critical thinking vocabulary in their questioning of peers too!

- Engage students in dynamic learning activities and assessments that promote independent thinking or exposure to the thinking of others. Suggested activities include partner or team-based lab experiments; research papers; reflective journaling; structured conversations with a partner, small groups, or the whole class; evaluations of text and images from the public media such as political speeches; simulations; role playing; fishbowl activities; panel discussions; brainstorming exercises; in-class debates; case studies; course blogs or wikis; individual or group argument mapping; social networking features such as asynchronous bulletin boards that are often found in course management systems; maintaining a paper or electronic portfolio, and so on.
- Provide numerous and frequent opportunities to practice critical thinking skills and receive formative feedback from the instructor, field supervisors, mentors, and peers. Interactions that result in constructive feedback can be incorporated by the student and reinforce self-regulation.
- Require students to provide reasons or explanations for all of their claims, interpretations, analyses, evaluations, and decisions. Ask *WHY* and expect a good, well-reasoned answer. Don't let students get by with shut-down clichés such as, “That’s just how I feel,” “I was brought up to think that...,” “My parents always said that...,” and “It’s common sense.”
- Model strong critical thinking for your students. Students watch us to see if we believe in the value of critical thinking, so what we say and do might be more powerful in motivating our students to build their critical thinking skills than anything they read or hear in a lecture. If we show that we practice the positive

critical thinking habits of mind and that we engage in problems and decisions by applying critical thinking skills, that message comes through to them. If we do not, we reflect a negative or contradictory message.

- Conduct valid and reliable summative assessments that evaluate students' thinking at the course, program, major, degree, and institutional levels.

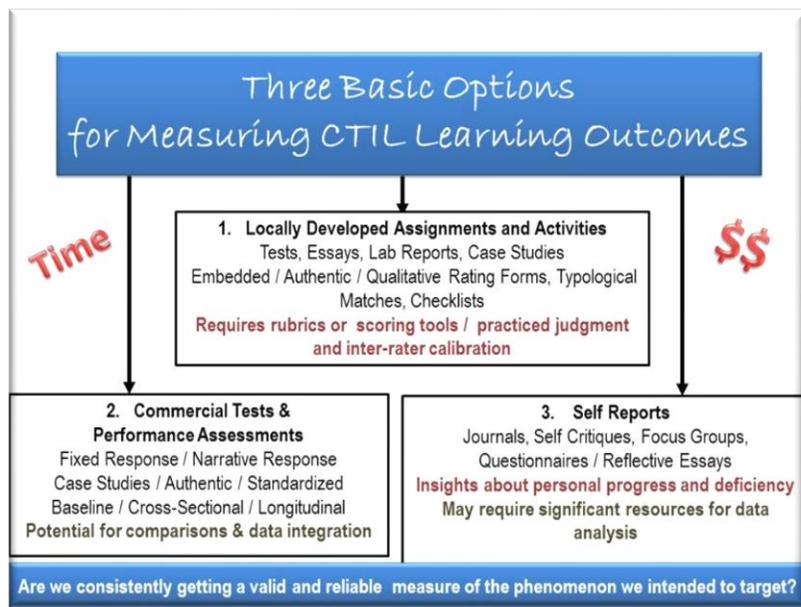
Determine appropriate performance standards, norms, and benchmarks within or external to your unit. Discuss assessment results from your courses, program and institution with your colleagues to draw inferences and make meaning of what you are finding.

Crafting Assessments to Elicit Critical Thinking

During my tenure as Director of Assessment at my university, I was responsible for evaluating student learning outcomes in our Core Curriculum. Not all of our learning outcomes were about critical thinking but many were. This work led me to a great revelation that I would like to share with you. The most significant finding from all of our studies of student learning in the Core was this: *The assignment had to elicit the learning outcome in order for us to effectively and accurately evaluate students' development or mastery of that learning outcome.* While this may seem like common sense, at my institution we had underestimated how challenging it can be to design assignments that align with the language of our learning outcomes. So what does that mean for the teaching and assessment of students' critical thinking? If we value critical thinking as a core competency and learning outcome in our courses, programs, and institution, then we need to engage students frequently in activities that allow them to practice their thinking and we also need to design or select valid and reliable assessments

that elicit critical thinking (the learning outcome) in order for us to evaluate students' thinking, provide them with feedback on how to further strengthen their skills, and to draw valid inferences of the learning being demonstrated within our educational community.

Three Strategies of Learning Outcomes Assessment



There are a variety of characteristics or continua by which one could categorize student learning assessments. One that has already appeared in this essay is the formative - summative

continuum whereby assessments are used to varying degrees as vehicles for providing developmental feedback to students to promote learning and / or as evaluative appraisals of degree of mastery at a fixed point in the learning enterprise. The criterion for the formative – summative dimension is the *purpose* of the assessment. I would like to introduce additional criteria at this point that inform decision making regarding the selection of student learning assessment strategies. One significant criterion is *resources* in the form of time, money and expertise⁶. In terms of the assessment of student learning,

⁶ This is no doubt a familiar theme for anyone who has been involved in a campus conversation about the adoption of an assessment strategy, or a new technology such as course management, student data management, email or ePortfolio system platforms, or other asset that requires considerable investment of campus resources.

a decision at the course, program or institutional level needs to be made as to whether to use a locally developed instrument or a commercially available tool. There are pros and cons to each of these decisions: Locally developed instruments can make use of existing data or embedded assessments that minimize the concern for motivating students but can accentuate the need for finding appropriate experts on campus to create valid and reliable measures and others to spend the time for data analysis and reports. Commercial instruments often have readily available benchmarking or norming data, can demonstrate validity and reliability, and may not require a lot of campus resources in terms of time, but may also be very expensive, may require a large sample size or depend on extrapolating from sampling student responses, and may not be completely align to the campus student learning outcomes. This is just a snapshot of concerns that shape the conversation about assessment of student learning and definitely apply in the context of assessing students' critical thinking.

Another criterion is the *question form* used in assessment instrument. The form of a learning assessment instrument is often described in terms of whether it employs fixed-response or open-response question structure. Common examples of fixed-response questions are multiple choice and forced choice (e.g., True/False) and target specific "correct" or "best" responses. Open-response questions formats include short answers and essays that typically elicit unique answers from each respondent but target a specific domain or range of "correct" or "best" responses. One can argue that question form is best viewed as a continuum rather than a strict dichotomy as there are question format such as sentence completion or "fill in the blank" that target specific words or phrases but can also vary by respondent. Like the case of a locally developed versus a commercial

instrument, there are pros and cons to selecting instruments that use fixed-response, open-response or a combination of these formats. Fixed-response questions have traditionally been recognized for their greater reliability and for the breadth of content that can be covered due to the larger number of questions that can be included in a testing session as compared to an open-response instrument. Fixed-response and open-response questions also differ in terms of the resources required for implementation. Fixed-response tests are typically quick and easy to score by human or machine because a single answer or small set of possible responses are being targeted whereas open-response instruments require analytic or holistic rubrics or rating scales which can require considerable resources to develop as well as use because of the need to calibrate multiple raters and review the qualitative response data⁷.

Fixed-choice questions are often written so as to elicit lower-order cognitive tasks such as recognition and recall because the response options are visible as compared to the cognitive requirement of generating an original response for an open-choice question. It is crucial to realize however that the tendency to prioritize breadth of content coverage rather than depth

Fixed-response Questions can Measure Critical Thinking!

The tendency for fixed response questions to elicit recognition and recall of content rather than high-order depth of understanding is a conscious decision of the test author and NOT a structural limitation of the question format itself.

⁷ It is acknowledged that machine scoring of open-response performance assessments is increasingly being utilized with commercially available instruments.

of understanding when crafting fixed-response questions is a *conscious decision* of the question writer and not a structural limitation of the fixed-response format itself.

A third and final criterion that should be mentioned in the context of assessing learning outcomes, particularly critical thinking, is that of *objectivity*. Here I am referring to the desire of directly assessing critical thinking skills through the evaluation of performance relative to measuring the students' arguably subjective self-evaluations as critical thinkers. Contemporary conceptualizations of critical thinking include reference to both the skills dimension and the dispositional dimension (i.e. habits of mind)⁸. While measure of critical thinking skills can be developed using locally developed or commercially available tests reflecting fixed-response or open-response formats, the assessment of students' critical thinking dispositions is more appropriately accomplished through self-report mechanisms such as questionnaires, journals, or reflective essays.

Assessing Critical Thinking in our Classrooms and Programs

I return now to the topic of teaching and assessing for thinking in our classrooms and programs. How is this accomplished? At the course level this is typically done through embedded assessments / assignments. This is often true for program level assessment as well. After you have written student learning outcomes (SLOs) including those pertaining to critical thinking, for your course or program, you can begin to consider the specific assignments that you will ask students to complete to evaluate whether they have achieved the learning objectives. Focus first and foremost on the action verbs (preferably they reflect critical thinking vocabulary!) in your learning outcomes. Brainstorm assignments or program level assessments that elicit students'

⁸ Facione, P.A. (1990). The Delphi Report: Executive Summary: (1990), American Philosophical Association. ERIC Doc ED315 423

critical thinking skills and dispositions as represented in those action verbs. There are numerous activities that lend themselves to critical thinking assignments such as quick writes, exit tickets, reflective logs, role plays, debates, meta-cognitive fishbowls, and the creation of iMovies, presentations, posters, and Web sites. You should not feel discouraged about crafting your own assignments or using a favorite assignment from a previous term. Just be sure that the assignment requires students to perform the skills and habits of mind that you are seeking to reinforce based on the course objectives. Your graded assignments should demand the same engagement of students' critical thinking as the classroom activities.

An embedded assessment must elicit the intended learning outcome in order to effectively and accurately evaluate students' development or mastery of that learning outcome.

Incorporate as many of these activities as you can in each of your class sessions as an opportunity for students to practice their critical thinking.

Using Scoring Rubrics to Evaluate Critical Thinking

Deciding how you will evaluate students' performances is as important as crafting the assessment tools themselves. If the courses students are taking require them to produce evidence of their thinking and learning - such as a short-answer essay, argument map, term paper, group report, field notes, reflective log entry, quick writes, quiz or exam, presentation, poster, debate, iMovie, wiki or blog, or portfolio - then you will have ample evidence in the form of embedded assessments from which to make your evaluations of their performances at the course and program level. If you use one or more

of these assignment ideas, then there is also a strong chance that the evidence of student learning will come in a form where you will evaluate narratives or subjective responses. Because of this likelihood that the majority of evidence will be qualitative in nature, it would be wise to create scoring rubrics for these assignments.

Scoring rubrics are descriptive scoring tools that are developed by educators to organize the analysis and evaluation of student performances. Scoring rubrics are effective means of characterizing the *quality* of students' work. Scoring rubrics articulate the criteria used for judging different levels of performance. Scoring rubrics facilitate the evaluation of narrative activities, live performances, or activities where there is likely to be a broad range of content or activity. Scoring rubrics might be used by instructors or peers to provide constructive feedback, given to students for purposes of self-evaluation, or distributed to the class before an assignment is due as a guide to how the student will be evaluated. For help in getting started with writing rubrics, consult one or more of the rubric generator sites geared toward educators on the Internet. In addition to the rubrics you develop for your specific course assignments, use the *Holistic*

Do Your Course Level and Program Level Assessments:

- Engage students in one or more critical thinking skills?
- Elicit students' critical thinking habits of mind?
- Provide opportunities to evaluate students' independent critical thinking and their thinking in groups?
- Get supported by in-class activities and feedback so students are able to practice and make appropriate modifications?
- Have scoring procedures (e.g. rubrics) to ensure reliable evaluation of student performance?

*Critical Thinking Scoring Rubric*⁹ to help establish the overall expectations for what students should endeavor to demonstrate when completing course assignments. Because we often “get what we measure,” it is reasonable to let students know that you expect them to demonstrate consistently strong critical thinking skills in their courses, majors, and throughout their college experience.

Teaching and Assessing for Thinking Starts on Day One

On the first day of class each term, most instructors take time to review the syllabus, assignments, and their expectations for student performance and participation. In many ways, this first day is essential for ensuring the success of the course. If you are like me, your goal on this first day and every day thereafter is to make students feel comfortable, welcome, respected, and safe so they will share their ideas and their reasoning. To this point, I would like to offer some thoughts on how we can maintain an open classroom climate where students are free to question all views on controversial issues, including the professor’s views. Again, many of these are likely to be familiar tools in your repertoire already, but perhaps there are a few novel ideas here that you can also consider how you might use:

- ✓ Engage the students with multiple activities starting on the first day that require them to apply their critical thinking skills and dispositions. Set the expectation that active learning is going to be the *modus operandi* for this course.

- ✓ Share the Active Learning paradigm with your students so that they understand the teaching philosophy of the course.

⁹⁹ The *Critical Thinking Holistic Scoring Rubric*, along with other critical thinking rubrics and Internet resources for critical thinking rubrics are included in this WASC Resource Guide.

- ✓ Encourage students to repeat back the comments made by others to show that they care about understanding their peers' perspectives. Model this for the students.
- ✓ Praise students for their contributions to the conversation to build their self-confidence in their critical thinking skills.
- ✓ Be the facilitator of the conversation, but not the driver. Ask questions and pause to let students think before responding. If there is silence, wait for students. Someone other than you should fill the uncomfortable silence. If you break the silence the first time, they will always wait for you in the future.
- ✓ Encourage students to interpret, analyze, and respond to each other's comments and questions. You should not always be the one to answer students' questions. Engage the students as learners to find answers.
- ✓ Remind students that they are going to be challenged in this course by claims and arguments that might not be consistent with their personal view points or beliefs. Encourage them to always treat one another with complete respect and tolerance for alternative points of view.

By creating an active zone of inquiry, your classroom will be a dynamic setting where students can discover a new awareness of their thought processes. They will actively engage their critical thinking skills and test their ideas, stretching the boundaries of their critical thinking habits of mind. It cannot be said enough times that your students need an abundance of time to work through your thoughtfully crafted critical thinking activities and exercises. If you are committed to teaching for thinking and follow the suggestions in

this essay, then your efforts will be rewarded when your students grow as critical thinkers. Most importantly, relax and enjoy the course! Your inquisitiveness and enthusiasm for critical thinking will come across and energize your students.

Teaching and Assessment for Critical Thinking... a Campus Commitment

Throughout this essay I have focused teaching and assessing for thinking primarily at the course level but the lessons are applicable as you think about assessment across the levels of your institution. Whether your assessment strategy at the program level, in the academic departments or in the general education program, utilizes embedded assessments, locally developed, or commercially available tools will be a decision that is made based on your institution's resources, accountability mandates, and campus culture. Regardless of the assessment strategy or strategies that are employed, the essential centrality of the students' educational experience as a practice field for developing their critical thinking skills and dispositions should never be underestimated. For all who will be teaching and assessing students' thinking at the course, program, or institutional level, I leave with you with this charge: Select (or design) and conduct valid and reliable assessments that evaluate students' thinking in a manner that is consistent with your articulated learning outcomes and that is meaningful and manageable given your resources. Be mindful of the importance of determining appropriate performance standards, norms, and benchmarks within or external to your unit. Don't undervalue the importance or underestimate the benefit of sharing and discussing assessment results from your courses, programs, and institution with your colleagues. These discussions are the context for interpreting, drawing inferences, evaluating, and make meaning of what you are finding! Use the findings to make informed decisions about curricular design and

modification, establishing or evaluating learning outcomes, creating faculty development programming, engaging campus and external stakeholders in future assessment endeavors, and determining future resource allocations so as to best promote critical thinking across the curriculum and the campus. And above all, never fail to be a strong critical thinker who courageously seeks evidence wherever it may lead you.

A Roadmap for Assessing Student Learning Using the New Framework for Information Literacy for Higher Education

By Megan Oakleaf

The New Framework

In the next several months, ACRL will likely approve a new and important document: the Framework for Information Literacy in Higher Education. This document is intended to replace the Standards for Information Literacy Competency Standards for Higher Education, a seminal publication that has guided information literacy instruction for well over a decade. Since 2012, the ACRL Information Literacy for Competency Standards for Higher Education Task Force has drafted and revised the new Framework document. This process has been very open, and as a result, has inspired academic librarians to engage in renewed reflection and conversation about the nature of information literacy and its instruction. At this writing, the Framework is still a work in progress. Multiple drafts have been circulated among librarians, feedback has been elicited, and the final revisions and submission to ACRL are expected to be completed in a few months.

Although the Framework is still a draft document, most librarians are beginning to consider how the new Framework and the anticipated “sunset” of the Standards will impact both their information literacy instruction and assessment efforts. The Task Force has acknowledged that the Framework is a significant change from the previous Standards. The Standards outline competencies, skills, and outcomes that students need to achieve in order to become information literate. In contrast, the Task Force has organized the new Framework around six frames, each centered on a “threshold concept” they determined to be an integral component of information literacy. For many librarians, threshold concepts are unfamiliar constructs, represent a different way of thinking about instruction and assessment, and require a concerted effort to integrate into practice.

It's All About Threshold Concepts

Threshold concepts are core tenets in a particular discipline that are transformative, irreversible, integrative, bounded, and potentially troublesome (Meyer and Land, 2006, 7-8). Threshold concepts are often given context by a profession; they are frequently explained as the concepts required to “think like” an economist, doctor, or mathematician (Meyer and Land, 2006, 23). They were originally posited by Meyer and Land during a coffee break conversation (Rhem, 2013). In this conversation, the two exchanged ideas about concepts that, when fully understood, change the way students see their discipline and perhaps themselves. Often these concepts are grasped over time and students have to pass through a “liminal” space, or “threshold,” before arriving at an “aha” moment (Rhem 2013). This notion caught on, and other educators have attempted to discern the threshold concepts central to their own areas of study. While some educators have suggested threshold concepts for a particular subject area, no disciplines have yet codified an agreed-upon list. Rather, most educators use the idea of threshold concepts as stimulus for conversing with colleagues or a way of reflecting on their own pedagogy. In information literacy circles, Townsend, Hofer, and Brunetti (2011) introduced the idea of threshold concepts, which the Framework Task Force has subsequently embraced. The Task Force’s

selection of threshold concepts as the central driver of the Standards revision process has been both lauded and questioned, at least in part because the term “threshold concept” is so new to many librarians.

Where Did the Outcomes Go?

In the Framework, each of the six frames includes a threshold concept as well as “knowledge practices/abilities” and “dispositions” associated with that threshold concept. The Task Force clearly states that neither the knowledge practices/abilities nor the dispositions are intended to be used as learning outcomes. The omission of learning outcomes in the Framework may be due to three factors. First, the Task Force made a conscious decision to shift away from the format of the previous Standards document which included over a hundred statements formatted as learning outcomes. Second, the Task Force hoped to make outcomes the purview of librarians working in a local, campus context rather than provide them at a national, profession-wide level.

Third, Meyer and Land, originators of the threshold concept, have provided little guidance on ways to transform threshold concepts into outcomes. At first glance, Meyer and Land do not appear to support pedagogy or assessment based on learning outcomes. Land and Meyer (2010, 66) state, “A one-size-fits-all statement of intended learning outcomes will simply not work” because, they say, it’s impossible to adequately describe a learning goal to students who haven’t yet achieved that goal. In an earlier work, Land et al (2006) state that there are too many different end-points in learning to describe them using outcomes. They assert:

The need for the learned to grasp threshold concepts in recursive movements means they cannot be tackled in an over-simplistically linear ‘learning outcomes’ model where sentences like ‘by the end of the course the learner will be able to’ undermine, and perhaps do not even explicitly recognise, the complexities of the transformation a learner undergoes. It is likely that any course requiring student engagement with threshold concepts and troublesome knowledge will entail considerable...post-liminal variation. Consideration of threshold concepts to some extent ‘rattles the cage’ of a linear approach to curriculum design that assumes standard and homogenised outcomes...We would argue...for the notion of learning as excursive, as a journey or excursion which will have intended direction and outcome but will also acknowledge (and indeed desire) that there will be deviation and unexpected outcome within the excursion; there will be digression and revising (recursion) and possible further points of departure and revised direction. (202)

Whether Meyer and Land believe that outcomes can’t be communicated to students who haven’t already achieved them or that it’s too difficult to write outcomes that capture wide variation at the end point of student learning, they appear to discount a learning outcomes approach to threshold concept assessment. At the same time, Meyer and Land recognize a need for assessment. They write:

If we were to promote a manifesto...to gain evidence of student understanding of threshold concepts as well as helping to promote that understanding, our desiderata would include...new modes of mapping, representing and forming estimations of students’ conceptual formation...a

rich feedback environment offered at the point of conceptual difficulty ('stuckness, the liminal state) as well as in the pre-, post- and subliminal states...a more nuanced discourse to clarify variation and experience and achievement through the various stages of the liminal journey...the possibility of an ontological (as well as conceptual) dimension of assessment...a more meaningful correspondence of students coming to terms with troublesome knowledge and transformation to patterns of grading...[a] simplif[ication] and optimis[ation of] assessment by focusing on threshold concepts as the jewels in the curriculum at programme level, where what are assessed are the key transformative dimensions of a learning programme...[and] a corresponding emphasis on helping students become aware of their learning in relations to threshold concepts. (2010, 76-77)

Based on their writings, one may conclude that the problems Meyer and Land have with learning outcomes are not insurmountable. In fact, threshold concepts are very well suited to learning outcomes assessment, as long as the assessments permit the use of authentic assessment approaches, provide useful feedback to students to help them over the "stuck places", emphasize individual variation in the journey that students travel to achieve them, recognize that learners may redefine their sense of self, link learning and grading in meaningful ways, organize programmatic assessment around transformational ideas, and support metacognition. Indeed, Meyer and Land provide a few examples of assessment approaches they believe align well with threshold concept assessment.

What Would Meyer and Land Do?

Meyer and Land offer both broad and specific recommendations for the assessment of threshold concepts. In general, Meyer and Land emphasize the importance of developing a "third ear" (a term borrowed from Ellsworth (1997) or "learning to understand what the students do not understand" (200). They also provide several examples that are more complete, such as pre- and post-test items (Taylor, 2006, 96) and responses to open-ended pre- and post-question prompts (Shanahan and Meyer, 2006, 106). Although these examples take a "snapshot" approach, a strategy they caution against (2010, 62), both techniques are suggested as ways to gain "insight into the possible source of any associated learning difficulties that students may have in acquiring the concept" (Shanahan and Meyer, 2006, 112) and locate "students' articulation of a threshold concepts within a troublesome framework...[and] track progression of their understanding of the concept over time" (Shanahan and Meyer, 2006, 113). Meyer and Land also raise concerns about assessments in which students engage in mimicry (2010, 73) or "produce the 'right' answer while retaining fundamental misconceptions" (2010, 62). In order to address these concerns, they recommend assessments that take a declarative approach, where students represent their knowledge. An example of this approach is concept mapping, which enables educators to "(a) discover what each student knows (rather than trying to anticipate it); (b) show what knowledge a student possesses, and illustrate how that knowledge is arranged in the student's mind; (c) move from traditional 'snapshot' testing which often focuses on isolated ideas rather than developmental thought or affective processes, and (d) recognise that some ideas may be resistant to change, but interrelationships with other ideas may be more fluid" (2010, 64). Land et al also support "think aloud" assessments that help externalize learning processes (2010, 65) and encourage metacognition (2016, 201). Examples include "diarised forms of assessment, portfolios, logs, patchwork

texts, sequential conceptual mappings...and blogs” (2010, 70). They hope that these assessment approaches will not only help identify the “stuck places” students encounter on the liminal journey to grasp a threshold concept but also help students begin to shift their sense of self from being students of a discipline to becoming practitioners of that discipline. While Meyer and Land’s limited literature on the assessment of threshold concepts does not provide substantial, detailed guidance, it does demonstrate their belief that threshold concepts are assessable using approaches familiar to librarians.

Ok, So Now What?

Because the new Framework differs substantially from the Standards—in conceptual underpinnings, areas of emphasis, document structure, and level of detail—librarians intending to use the Framework to teach and assess information literacy frames may benefit from a roadmap to launch their efforts.

Step 1 – Get Inspired

While the proposed Framework is organized around six frames, each focusing on one threshold concept, the Task Force has stated that the list should not be considered exhaustive and that additional threshold concepts may be added in the future. ACRL reviews this type of document every five years, but librarians need not wait for a formal Framework review to adapt the threshold concepts for their campus environment. Indeed, librarians should feel comfortable adjusting and amending the Framework to suit their needs. For example, librarians could—through collaboration and conversation with colleagues, students, and other stakeholders—identify additional threshold concepts or merge existing ones. They may choose to expand beyond a strict threshold concept definition and add additional “big ideas” or “enduring understandings” (Wiggins and McTighe, 2005, 342) that are worth teaching and may better fit student needs. Librarians could also work with disciplinary faculty to identify threshold concepts in the disciplines, then seek opportunities to work together to teach those disciplinary threshold concepts, especially when they merge with information literacy, research, and critical thinking concepts. Essentially, librarians can use the Framework as inspiration to focus on concepts, rather than exclusively on tools and techniques, and those concepts can be added or subtracted as student and faculty needs change.

Step 2 – Bite the Bullet

After identifying and prioritizing the threshold concepts or additional “big ideas” they wish to teach, librarians need to transform those concepts into learning outcomes. Learning outcomes are essential for good teaching; they establish the content of instruction, provide a framework for designing pedagogy, and drive meaningful assessments. Because the Framework does not include learning outcomes, librarians face the challenge of developing their own. This level of freedom comes hand in hand with a level of ambiguity...and where there is ambiguity, there can also be a fair amount of difficulty. Learning outcomes can be challenging to construct, but once librarians master outcomes language, they can be composed quickly and easily. After all, outcomes describe what librarians hope students will know or be able to do as a result of instruction. Most librarians have an intuitive, if not articulated, sense of what that is!

There are several formulas for writing outcomes. At the simplest level, outcomes follow the structure: “The student will be able to +ACTIVE VERB...” For example:

- **The student will be able to map** linked citations representing scholarly conversation on a topic. (Scholarship is a Conversation)
- **The student will be able to list** areas of consensus and disagreement among publications on a topic. (Research as Inquiry)
- **The student will be able to brainstorm** characteristics of authors deemed as trustworthy on a topic. (Authority is Constructed and Contextual)

Librarians searching the outcomes literature will find more complex formulas as well. Some educators prefer to use the ABCD structure, which includes the audience (student), behavior (task or ability expressed as a verb), condition (under what circumstances), and degree (to what extent). Others use the IOT structure, which adds an “in order to” phrase to the end of an outcome statement. None of these patterns are better or worse than the others. The key to an effective outcome is the verb. Verbs should identify behaviors that will demonstrate a student’s level of learning in an observable, i.e., measurable or “judge-able,” way. Verbs that do not call for an observable behavior (e.g., understand, recognize, know) result in outcomes that are not assessable.

Step 3 – Agree or Agree to Disagree

Once librarians translate threshold concepts or other teachable “big ideas” into a list of outcomes, the next step is to determine who has to agree on the list. Outcomes used by just one librarian to guide an instructional session or collaboration with disciplinary faculty may require only the agreement of the few who are actively teaching or assessing those outcomes. However, librarians who wish to build a program-level picture of what and how well students are learning will need to seek and secure agreement of all those who are teaching in the program. If librarians wish to link their outcomes to those taught by other educators on campus, such as disciplinary faculty or co-curricular professionals, then a greater degree of agreement on outcomes, or at least a mapping of linkages between library and other outcomes, is necessary. Librarians who hope to connect their learning outcomes to institutional outcomes, accreditation standards, or professional association documents (e.g., AAC&U VALUE rubrics), will need to seek and even greater level of agreement. In short, the greater the reach of an outcome, the more important it is that the stakeholders impacted by that outcome support it.

Step 4 – Teach Backwards

Once librarians write and agree upon outcomes, they can commence instructional design activities. Following the precepts of the Understanding by Design model (Wiggins and McTighe, 2005), outcomes drive the design of both pedagogy and assessment. Beginning with the end (outcome) in mind, librarians should ask themselves two questions: How will I know students have achieved the outcome? What could students do to show me they’ve achieved it? The answer to those questions guides both the teaching methods and the assessment approach. Using the example outcomes offered in Step 2, students might demonstrate their learning by:

- Sketching a map of citation links among articles, highlighting articles that are frequently cited or never cited, then writing a brief explanation of the relationships among articles and how those relationships inform their choice of articles to use in their own academic work. (Pedagogy = sketching and explanation; Assessment = collection and analysis of sketches and explanations.)
- Drafting a list of areas of consensus or disagreement among websites provided on a topic, highlighting relevant website content, then discussing their lists with peers in small groups and reporting out to the large group. (Pedagogy = listing, discussing, and reporting; Assessment = observation and analysis of lists and report outs.)
- Brainstorming author characteristics that indicate trustworthiness on a particular topic as a large group, collaborating to generate characteristics posted and shared with all students, then applying characteristics to the output of students' independent search results. At the close of instruction, reflecting on how one characteristic was used to improve their search. (Pedagogy = group brainstorm, list creation, application to individual tasks; Assessment = analysis of group-generated characteristics and individual reflections.)

What do all these examples have in common? They all employ active learning strategies...which are simultaneously active assessment strategies.

Step 5 – Draw the Map

Librarians who design instruction realize quickly that each teaching and assessment event needs to be analyzed in the context of other teaching and assessment activities. Instruction should build upon concepts and skills students already know and minimize needless repetition of mastered content. In order to scaffold instruction properly, librarians can analyze both student needs and academic requirements. Librarians may ask themselves: What do students already know? What do they need to know to complete their assignments? To prepare for goals beyond their current program of study? To answer these questions, librarians can identify information literacy and discipline-based threshold concepts, conduct needs assessments, analyze academic requirements, sketch the curricular structure of their institutions, and learn about typical trajectories of graduating students. Armed with this information, librarians can begin to develop curriculum maps merging student learning opportunities and library instruction activities; such maps will facilitate strategic decision-making.

Step 6 – Get Real

Armed with overarching threshold concepts, measurable outcomes, and a curriculum map, librarians can begin to consider their options for deploying instruction. Instructional options include assignment-focused “one shots” (single or serialized), orientations, online tutorials, reference desk interactions, research consultations, collaborative course or assignment design, course-integrated or embedded instruction, and for-credit classes. Certainly, some options are more flexible, scalable, or manageable than others. But all approaches can be utilized to teach threshold concepts and other “big ideas” via outcomes and active learning/assessment strategies.

Step 7 – Hunt and Gather

In order to teach well, librarians need to actively engage students in learning. In order to assess well, librarians need to identify and collect evidence of those active engagements. Librarians who want to know whether or not students have achieved learning outcomes—and ultimately grasp threshold concepts—need to find ways to observe and analyze students’ learning process or products that result from that process. In other words, librarians need to capture artifacts of student learning, either in real time (dynamic) or in document (static) form.

In the past, librarians have used a variety of approaches to collect evidence of learning (Oakleaf, 2008). With the advent of the Framework and its emphasis on concepts rather than skills, librarians will be less served by employing survey and fixed-choice test questions and best served by eliciting performance assessments. Performance assessments may include research logs, reflective writing, “think alouds,” self or peer evaluations, research drafts or papers, open-ended question responses, bibliographies, presentations, posters, performances, portfolios, worksheets, and concept maps. These assessments may be analyzed qualitatively or quantitatively, and they may be used formatively (to give feedback to learners and help librarians revise teaching strategies quickly) or summatively (to establish what students have learned at some end point, such as the termination of a course or degree program).

Step 8 – Know It When You See It

To assess artifacts of student learning, librarians need to answer a series of questions:

- How will I know when students have achieved an outcome?
- What will their artifacts look like?
- What elements am I looking for in their artifacts?
- How well do students need to perform these elements?

Once librarians know what they are looking for in student artifacts, they can develop rubrics to describe the elements, or “criteria,” that demonstrate learning as well as the various performance levels students might reasonably be expected to achieve. Typically, librarians composing rubrics will begin by envisioning a student artifact that demonstrates attainment of an outcome, then work backward to describe typical developmental stages that students pass through on the way to achieving that outcome. When working with threshold concepts, librarians might begin with a description of a student who has achieved the post-liminal stage (in which the student now “thinks like” a member of the community (Meyer and Land, 2006, 23)), then work backward to describe pre-liminal, liminal, and subliminal stages (Meyer, Land and Baillie, 2010, xi), as well as typical “stuck places” (Ellsworth 1997). For example, a rubric assessment may capture students along a continuum of understanding, as they demonstrate “troubled misunderstanding,” “limited understanding,” or “mimicry” of understanding (Meyer and Land, 2006, 24) and as they struggle with forming an identify as a member of a particular learning or professional community. By articulating exactly what librarians are looking for in student achievement of outcomes at each stage in the student journey, rubrics ensure a more valid approach to assessment. When rubrics are “normed” or calibrated for use by multiple raters, they also lead to reliable assessment results (Holmes and Oakleaf, 2014).

Step 9 – Roll It Up & Report It Out

Many librarians need to generate and report the results of their instruction at the programmatic level. Because programmatic assessment reporting requires librarians to aggregate information from multiple librarians, diverse student populations, and a variety of instruction offerings and approaches, it can present a challenge. However, when librarians agree upon a set of outcomes, then code their instructional efforts and assessment data by outcome, they can “roll up” their evidence in a reportable structure. In this way, outcomes can serve as an organizational scheme under which all instruction and assessment that aligns with a particular threshold concept can be grouped together. Logistically, outcomes and threshold concepts can be linked to instruction and assessment using paper methods, a spreadsheet, or full-fledged assessment management system (Oakleaf, Belanger, and Graham, 2013). Over time, librarians can share the results of instruction for each outcome, thus providing an encompassing picture of what threshold concepts have been taught and the degree to which they have been learned. This information can be communicated to librarians and stakeholders, including students, faculty, administrators, and accreditors.

Step 10 – Close the Loop

Ultimately, the goal of all instruction and assessment efforts is to engage in reflective practice (Oakleaf, 2009). Whether assessments demonstrate successful learning or fall short of that goal, the options for using the results are threefold. If the assessment has produced useable results, librarians may choose to 1) celebrate a success, 2) make a decision, or 3) take an action. (Of course, if the assessment itself is flawed and has resulted in spurious data, then librarians should use the experience to improve the next assessment effort.) In most cases, librarians will find themselves making decisions and taking actions to continuously improve their instruction and assessment activities.

The Road Ahead

The new Framework for Information Literacy in Higher Education represents a departure from the old Standards for Information Literacy Competency Standards for Higher Education. The underlying constructs, areas of emphasis, structure, and degree of detail are all dissimilar. The new document is based on broad frames; focused on concepts rather than skills; comprised of threshold concepts, knowledge practices, and dispositions; and abbreviated in length. All these changes will undoubtedly impact librarians attempting to update their instruction and assessment approaches, and therefore, a map for the journey may be necessary. Still, most librarians will recognize the route and many of the stops along the way. The inspiration may have changed, but the road—as circuitous as it is—is well traveled and there are plenty of guides to follow.

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<http://www.englishcompanion.com/pdfDocs/foundationskills.pdf>

<http://www.uni.edu/adp/documents/LinksforCriticalThinkingRubrics.pdf>

<http://academic.pgcc.edu/~wpeirce/MCCCTR/Designingrubricsassessingthinking.html>

<http://course1.winona.edu/shatfield/air/critical%20thinking%203.pdf>

http://www3.wooster.edu/teagle/critical_rubrics.php

<http://railsontrack.info/rubrics.aspx>

<http://www.njcu.edu/Guarini/Instructions/Rubrics.htm>

<http://subjectguides.wcupa.edu/InformationLiteracy>

<http://www.luminafoundation.org/publications.html>

<http://www.rubrician.com/writing.htm>

http://www.teach-nology.com/web_tools/rubrics/

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http://www.uen.org/Rubric/rubric.cgi?rubric_id=13<http://www.rcampus.com/indexrubric.cfm>

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May 5, 2016. Mills College, Oakland, CA
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