

Using Problem-Solving Protocols for Assessment

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Outline of Workshop

- Introductions
 - Context
 - Problem-Solving Analysis Protocol (P-SAP)
 - P-SAP Rubric & Coding Exercise
 - Using Protocols
 - Closing Comments
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Introductions

- Who are you?
 - What is your experience with assessment?
 - What are your assessment needs?
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Context

Assessor

- Individual faculty
- Department, program or discipline team
- Institution or interdisciplinary team

Assessed

- Course content knowledge & skills
 - Discipline or program specific knowledge & skills
 - General problem-solving skills, critical thinking, knowledge transfer
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Course-Embedded Assessment Tools

- **Steps for Better Thinking:** <http://www.wolcottlynch.com>
 - work begun 10 years ago (Lynch, 1996; Lynch & Wolcott, 2001) to provide model for teaching and assessing higher-order thinking skills, critical thinking and open-ended problem solving; grounded in King & Kitchener's (1994) reflective judgment model and Fischer's dynamic skill theory (Fischer, 1980)
 - two rubrics – student feedback in classroom; research and formal assessments
 - currently tested at Daemen College and South Dakota School of Mines & Technology; used worldwide
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Course-Embedded Assessment Tools (continued)

- **CLAQWA:** <http://usfweb2.usf.edu/eval/CLAQWA/>
 - designed over 6 years ago at University of South Florida to help instructors assess students' writing skills and cognitive development (Flateby & Metzger, 1999; 2001)
 - two rubrics - writing and cognitive skills; can be applied to essay as regular course work
 - currently used for formative program assessment and GE assessment at USF- testing includes sample of work when students first enter USF and sample during upper-level exit courses
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Course-Embedded Assessment Tools (continued)

□ **The Critical Thinking Rubric:**

<http://wsuctproject.wsu.edu/ctr.htm>

- developed over 6 years ago at Washington State University to foster student higher-order thinking skills and reform faculty practice
 - rubric for critical thinking and contexts for consideration designed to be integrated into courses and used to score student essays
 - Critical Thinking Project is collaboration between WSU Writing Programs, General Education Program, and Center for Teaching, Learning & Technology; adapted version used at Miami University (Ohio)
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Course-Embedded Assessment Tools (continued)

□ **Problem-Solving Analysis Protocol (P-SAP):**

- developed by Steinke and Fitch (2003) to assess application of content knowledge to "real world" problems; problems adapted to fit course content; based on work by Eyler and Giles (1999) on cognitive outcomes
 - rubric codes analysis of problems and solutions for causal loci and complexity; can be integrated into courses as exercises or graded assignments
 - tested at several institutions in Iowa, Michigan and Illinois; high inter-rater reliability (.75-.94 range) and good construct validity with intellectual development and cognitive learning measures
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P-SAP Rubric

- 1st question
 - Problem Analysis Locus
 - Problem Analysis Complexity
 - 2nd question
 - Causal Locus
 - Causal Complexity
 - 3rd question
 - Solution Locus
 - Solution Complexity
 - 4th question
 - Solution Analysis Locus
 - Solution Analysis Complexity
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Sample Coding Exercise

- Four coding samples: A #1, A#2, B#1 and B#2
 - Half the room will start with set A and the other half will start with set B
 - Get together in groups of 3 to discuss and code the samples (20 minutes)
 - Large group discussion will follow
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Using Protocols

- Recommendations for adapting the problems on the P-SAP
 - Integrating the P-SAP into courses
 - Explore use of protocols for assessment at your institution
 - Advantages and disadvantages of using protocols for assessment
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Closing Comments`

- P-SAP provides course-embedded authentic assessment measure
 - Begin by defining your learning objectives (e.g., problem solving, critical thinking, intellectual development, writing) then find the measure(s) that best fit your learning objectives.
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