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Statistical Literacy Using Odysseys2Sense

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Joint Mathematics Meeting
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Paper at www.StatLit.org/pdf/2011SchieldMAA.pdf
Slides at www.StatLit.org/pdf/2011SchieldMAA6up.pdf

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Teaching Q/L Ideas: The Problem

Earlier QL courses "had one thing in common that contributed to their remaining a small elective rather than a major requirement -- they were designed specifically to focus on ideas rather than techniques."   [Steen, Achieving QL]

This made them more difficult for teachers to teach and for students to master, and for that reason they thrived only in special niches out of the mainstream of college mathematics." p. 39

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Web Forums vs. Graded Papers

ADVANTAGES of Web Forums:
• Web-based: Available in Moodle, Blackboard, etc.
• Allow students to respond to each other
• Give immediate feedback; promote dialogue
• Allow students to disagree (argue) in real time
• Minimize teacher time; allow large class sizes.

DISADVANTAGES of Web Forums:
• Students know who is writing what; biases reviews
• Students are not being reviewed by the teacher/expert
• No easy way to "score" the final results

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http://odysseys2sense.com

Design/programming by Larry Copes and Ben Cooper

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Odysseys2Sense

An anonymous web forum in which your power and influence are determined by your contributions as rated by other players as civil, accurate and thought-provoking.

The Odyssey is an epic Greek story about Odysseus, a mythic hero known for his rationality and inquiring mind as well as for his patience, courage, and prowess.

Your Odyssey involves multiple **challenges**. To meet a challenge successfully requires you to think critically, ask questions, take risks, and demonstrate patience and expertise.

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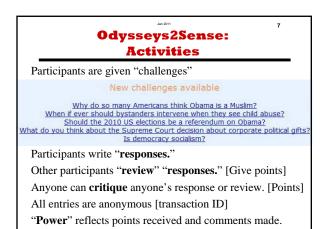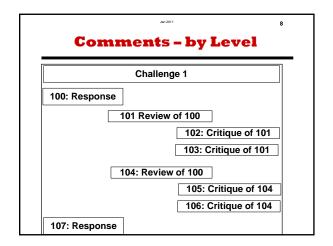
Odysseys Forum

ADVANTAGES [BEYOND FORUMS]:
• Students are **anonymous**. No biased reviews.
• Computes player **power** based on number and quality of reviews as evaluated by your peers.
• Every participant always knows their **power** and the power of the highest player in their Odyssey.

DISADVANTAGES
• Students not necessarily reviewed by the teacher/expert.
• Students may still try to "game" the system.
• Online respondent may not be the real student.

Odysseys2Sense: Activities

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Participants are given "challenges"

New challenges available

Why do so many Americans think Obama is a Muslim?
When if ever should bystanders intervene when they see child abuse?
Should the 2010 US elections be a referendum on Obama?
What do you think about the Supreme Court decision about corporate political gifts?
Is democracy socialism?

Participants write "**responses**."

Other participants "**review**" "**responses**." [Give points]

Anyone can **critique** anyone's response or review. [Points]

All entries are anonymous [transaction ID]

"**Power**" reflects points received and comments made.

Comments – by Level

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Challenge 1

100: Response

101 Review of 100

102: Critique of 101

103: Critique of 101

104: Review of 100

105: Critique of 104

106: Critique of 104

107: Response

Response Grading

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Responses are rated on a simple four-point scale:

- 1 point: doesn't answer the given question, solve the problem, or make a clear claim
- 2 points: answers the question, solves the problem, makes a clear claim
- 3 points: same as above, but also explains the solution or defends the claim well
- 4 points: same as with 3 points, but also goes an extra step: gives a second approach, poses good extension questions, relate the challenge to something we did in class, etc.

Review/Critique Grading

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Reviews and critiques are rated between -2 and + 2 on three different scales using the A-H-C criteria:

- A: Is it accurate or factual?
- H: Is it helpful or thought-provoking?
- C: Is it civil?

Uncivil contributions get low ratings from the other players and eventually are not displayed. Their authors lose power and influence.

Power Calculation

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A participant's power depends on

- the scores given in the responses and critiques by other participants, and
- the power of those making the responses and critiques.

Evaluators with lower power have less influence on your power than those with higher power.

Outsider Participation

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Students may be rated anonymously by

- Their teacher
- Other teachers
- Other people interested in statistical literacy (journalists, knowledge workers, etc.)
- Students that have taken the course previously who want to maintain or improve their skills,
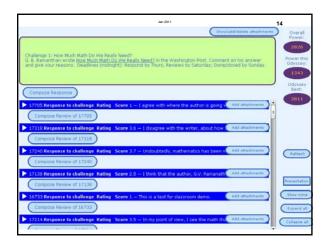
Note: Any comment can be graded down if the commenter graded too high or too low without reasons.

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Actual Challenges

5 Water: A Diet Drink?
4 ADHD Leads to Weight Gain?
3 Interpreting a Data Display
2 Social Construction of Statistics
1 How Much Math Do We Really Need?

Augsburg College: Fall 2010.

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Student Evaluation

Odyssey was difficult: 52% at start, 15% at end.
Odyssey was valuable: 37% at start, 62% at end.
Odyssey was enjoyable: 50% at start, 62% at end.

Odyssey improved your critical thinking: 70% agreed.
   12% considerably, 26% moderately, 32% slightly,
   22% neutral, 8% disagreed.

Prefer Odyssey online to teacher-graded papers: 72%

72 students; 6 classes 4 teachers: Fall 2010.

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What Did you Like Most?

Convenience, straight-forward, anonymous
Something new, fun and engaging
Instant feedback/scoring
Feedback is more honest and less fluffy
Thought-provoking arguments
Involved critical thinking, learn from others
Able to critique others
I can read as many responses as I want

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Conclusion

Teaching statistical literacy requires teaching
critical thinking about numbers as evidence in
arguments.

Odysseys2sense is a unique and powerful tool
in helping students develop their ability to reason
with numbers – especially in large classes.

Schield, Milo (2007). *Teaching the Social Construction of
Statistics*, Midwest Sociological Society, Chicago. See
www.StatLit.org/pdf/2007SchieldMSS.pdf.