Outcomes Assessment in Numeracy Courses
Experience Sharing

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Background:
• Implementation of the new 4-year curriculum
• Establishment of General Education (GE) program

GE program
• Promote Whole Person Education
• Transferable skills, guiding principles, and attitudes needed in professional and personal lives
Intended learning outcomes of GE program (PILOs)

1. Communicate effectively as speakers and writers in both English and Chinese;
2. Access and manage complex information and problems using technologically appropriate means;
3. Apply appropriate mathematical reasoning to address problems in everyday life (assessed by the selected Numeracy courses);
4. Acquire an active and healthy lifestyle;
5. Use historical and cultural perspectives to gain insight into contemporary issues;
6. Apply various value systems to decision-making in personal, professional, and social/political situations (assessed by the selected Value and Meaning of Life – VML courses);
7. Make connections among a variety of disciplines to gain insight into contemporary personal, professional, and community situations.
Assessment process
• Centre for Holistic Teaching and Learning
• 4 Numeracy GE courses
• Blackboard Outcomes
  – Selection of mature student work
  – Actual assessment
• Group of assessors
  – Dr. Eva WONG (CHTL)
  – Dr. Leevan LING (MATH)
  – Dr. YAO Yuan (MATH)
  – Dr. Simon TO (MATH)
• Generic rubrics
  – NOT course-specific
My courses under assessment (2012-2013 Semester 1):
• GCNU1005 Beating the Odds (Probability)
• GCNU1027 Speaking of Statistics (Statistics)

Some features:
• Explanations and calculations BOTH emphasized
• Rubrics not widely used in grading process
• Assignments done in classes
• HKBU Blackboard used as course webpage
Some features:

- Explanations and calculations BOTH emphasized

Find the positive predictive power and the negative predictive power of the test among these players. (0.5 points each)

\[
\frac{320}{370 + 184}
\]

Positive predictive power: \[63\%\]

\[
\frac{11416}{84 + 14416}
\]

Negative predictive power: \[48\%\]

Suppose that in the best baseball league of the country, the usage of this substance is relatively more common. Would the positive predictive power among the players in this league be different from the one obtained above? (1.5 points)

Yes, the positive predictive power should be higher if the prevalence is higher while the specificity and sensitivity of the test unchange. With higher prevalence, more people there are more substance users and thus, more true positive cases. Also, the number of false positive should be less clear athletes. The proportion of true positive cases should be larger with more true positive and less false positive.
Some features:

- Rubrics not widely used in grading process
  
  **BUT** rubrics can be used in outcome assessment!
Some features:

- Assignments done in classes
  - Hard copies of students’ work only
  - Students’ work manually scanned (not optimal)
- HKBU Blackboard used as course webpage

Possible improvements (course practice):

- Utilize centralized e-platforms for at least some assignments at later stages (facilitate selection of mature student work)
Use of generic rubrics:

• Identify related categories (with other assessors)

Suppose that 8% of the baseball players in a country are users of a performance enhancing substance. A test for the use of the substance with 80% sensitivity and 96% specificity is available. Complete the following table of the average result for every 5,000 players tested: (0.5 points for each correct row; no steps required)

<table>
<thead>
<tr>
<th></th>
<th>Substance users</th>
<th>Clean athletes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>320</td>
<td>184</td>
<td>504</td>
</tr>
<tr>
<td>Negative</td>
<td>80</td>
<td>4416</td>
<td>4496</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>4600</td>
<td>5000</td>
</tr>
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Observation #1:
Involvements of categories are NOT explicit
– Assignments set according to CILOs

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Observation #2:

Some categories are generally more heavily involved

- Same rubrics for multiple courses
- Blind spots (of myself) identified

Suppose that 8% of the baseball players in a country are users of a performance enhancing substance. A test for the use of the substance with 80% sensitivity and 96% specificity is available. Complete the following table of the average result for every 5,000 players tested: (0.5 points for each correct row; no steps required)

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<th>Representation</th>
<th>Calculation</th>
<th>Application/Analysis</th>
<th>Assumption</th>
<th>Communication</th>
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- Possible refinements suggested
How outcomes assessment helps TAL #1:
Outcomes assessment *process*:
- Blind spots (coursework design) identified
- Possible refinements (coursework design) suggested

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How outcomes assessment helps TAL #2:
Outcomes assessment results:

- Weaknesses (students’ performance) identified
- Refinements (teaching focus/method) needed

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Impacts of Outcomes Assessment on a front-line teacher

Embrace e-platforms (course practice)

Identify blind-spots (coursework design)

Identify students’ weaknesses (teaching focus)

Exchange of ideas (teaching practice)

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Acknowledgement:

Thank You!

Simon Kai-Ming TO 30 May 2013