Student Assessment In Problem-based Learning

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Group Dynamics Seminar

Class Settings

- Traditional class setting
    - lecture-based
    - deliver as much information as possible, as quickly as possible
    - students rely on transcription, memorization, and repetition
- Problem-based learning (PBL)
    - students work on teams and teach each other
    - learn in context of compelling problem and from experience
    - no change in amount of knowledge acquired
    - but, are more likely to use it spontaneously to solve new problems
    - overall greater student satisfaction/study habits
    - Major, Palmer (2001)

The purpose of assessment

The chosen method of assessment should:

- effectively assess the objectives of the unit of study,

- be aligned with the overall aims of the program,

- include the development of disciplinary skills.

Assessment Type

- Objective or Subjective
  - Specific observable/measurable criteria?

- Atomic, Analytic, Holistic, General Impression
  - Atomistic = quantify presence of specific part (multiple choice)
  - Analytic = judgments about parts and appropriateness of parts (scoring an essay based on number of citations, proper grammar, etc.; using a rubric)
  - Holistic = determination of overall quality of a work through standardized consideration of various aspects, without tallying (overall score for presentation)
  - General = scoring is unique to individual evaluator

- Self, Peer, Collaborative, or Instructor-based

Assessment Methods (Oxford)

- Thinking critically and making judgments
  - Developing arguments, reflecting, evaluating, assessing, judging
- Solving problems and developing plans
  - Identifying problems, posing problems, defining problems, analyzing data, reviewing, designing experiments, planning, applying information
- Performing procedures and demonstrating techniques
  - Computation, taking readings, using equipment, following laboratory procedures, following protocols, carrying out instructions
- Managing and developing oneself
  - Working co-operatively, working independently, learning independently, being self-directed, managing time, managing tasks, organizing

Assessment Methods (Oxford)

- Accessing and managing information
  - Researching, investigating, interpreting, organizing information, reviewing and paraphrasing information, collecting data, searching and managing information sources, observing and interpreting
- Demonstrating knowledge and understanding
  - Recalling, describing, reporting, recounting, recognizing, identifying, relating & interrelating
- Designing, creating, performing
  - Imagining, visualizing, designing, producing, creating, innovating, performing
- Communicating
  - One and two-way communication; communication within a group, verbal, written and non-verbal communication. Arguing, describing, advocating, interviewing, negotiating, presenting; using specific written forms

Assessment Methods for PBL

- A non-traditional approach calls for non-traditional measures
- Focus on the contextual nature, require an authentic and relevant product, and help students make judgments about their performance
    - outside/expert evaluation of final product
    - content analysis of projects
    - focus groups
    - peer evaluations
    - journals or activity logs
    - personal reflections
    - Major, Palmer (2006)

Considerations

- Fostering creative thinking
    - subjective and end product evaluations preferred
    - Chamorro-Premuzic (2006)
- Use of peer assessments
    - students' view as a technical tool to facilitate assessment processes and to aid comparisons with others, but not as learning aid or forum for peer-criticism
    - should be small part of total course grade
    - Wen, Tsai (2006)

Creative Assessment

Chamorro-Premuzic (2006)

- 307 undergrad psych. students from 2 UK universities

- Creative thinking/personality inventory during first week

- Academic performance measures collected throughout 4 year period (overall exam grades, continuous assessment through tutorial reports, final dissertation)

- At the end, asked students about preference regarding assessment methods (multiple choice, timed essays, oral, final project, continuous assessment, and group work)

Creative Assessment

Chamorro-Premuzic (2006)

- Strong (0.46/0.35) correlation between creative thinking/openness to experience and final dissertation

- Strong correlation (0.42) between conscientiousness and overall exam grades

- Strong preference against multiple choice (-0.58), timed exams (-0.3), and continuous assessment (-0.34) by creative students

- Strong preference for oral exams (0.45) by creative students

- Overall preference against multiple choice, timed exams

Creative Assessment

Table 2. Correlations among creative thinking scores, personality traits, and academic performance

	2	3	4	5	6	7	8	9
Creative thinking	−0.09	0.38**	0.46**	0.17**	0.05	0.16**	0.46**	−0.07
2 Neuroticism	—	−0.23**	−0.03	−0.13*	−0.16**	−0.21**	−0.11	−0.14*
3 Extraversion		—	0.46**	0.51**	0.19**	0.03	0.30**	−0.06
4 Openness			—	0.41**	0.11	0.02	0.35**	−0.10
5 Agreeableness				—	0.22**	0.02	0.14*	0.01
6 Conscientiousness					—	0.42**	0.27**	0.21**
7 Overall exam grades						—	0.45**	0.35**
8 Final dissertation							—	0.12*
9 Continuous assessment								—

Table 4. Follow up correlations of creative thinking and big five with preference for assessment methods inventory

	Multiple choice	Timed exam	Viva voce	Final project	Contin. assess.	Group work
Creative thinking	−0.58**	−0.30**	0.45**	0.13*	−0.34**	0.15**
Neuroticism	−0.02	−0.08	−0.05	0.01	0.13*	0.02
Extraversion	−0.14*	−0.47**	0.18**	0.09	−0.01	0.15*
Openness	−0.23**	−0.43**	0.25**	0.17**	−0.01	0.19**
Agreeableness	−0.05	−0.45**	0.09	0.07	0.06	0.17**
Conscientiousness	−0.09	−0.06	0.04	0.09	0.05	−0.01

Peer Assessment

Wen, Tsai (2006)

- 280 university students from 2 Taiwan universities

- 34-item questionaire regarding view of peer assessment and proportion of grade

- Controlled for effect of education level (85% undergrad), gender (58% male), and prior peer assessment experience (59%)

- 66.2% thought peer assessment should count for small portion of grade; none wanted 100%

- Generally, students have positive view of peer assessment, with stated guidelines

- Male students were more positive (more confident about ability to rate peers?)

Citations

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