

Workshop Series on Developing and Adopting Marking Rubrics in Relation to Assessment Types

Part 1: An Overview

Why, What and When to Develop and Adopt Marking Rubrics in Assessment

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 - From the perspective of Outcome-Based Approach
 - From the perspective of PolyU's policy
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What do your students usually ask about assessment?

Step 1: Go to URL:



Step: 2 Join session number:

5294

Step: 3

Type in your responses and press “submit”

<http://ed2.polyu.edu.hk>



Assessment

...is the
engine
which drives
student learning

(John Cowan)

Functions of assessment

- **Summative:** provide information about a student's knowledge
- **Formative:** provide information about a student's strengths and weaknesses, such that it becomes an ongoing part of the whole teaching and learning process.
 - ✓ *Evaluative:* provide ways to create instruction that better fits each student's needs
 - ✓ *Educative:* provide students with an understanding of how they learn

Two common types of assessment in education

	Summative Assessment	Formative Assessment
Also known as	Assessment of learning	Assessment for learning; Assessment as learning
Main Purpose	Assign grades to students	Provide feedback to enhance students' learning
Main Focus	Evaluative (Backward looking)	Developmental (Forward Looking)

Using Assessment for Both Grading and Support Learning
in the Outcome-Based Approach

Why rubrics?

- *from the perspective of Outcome-Based Approach*
- *from the perspective of PolyU's policy*

Model of Outcome Based Approach to Student Learning at Subject level

What you want your students to learn in the subject and how that relates to the programme as a whole:

Aims and Learning Outcomes

How you want your students to learn:

Teaching and Learning Methods aligned with Learning Outcomes

How you will judge how well your students have learnt:

Assessment methods and Standards aligned with Learning Outcomes

Criteria and standards of assessment

- norm reference
- criterion reference
- standards reference

Some definitions:

Norm: A comparison of the achievement of one students to another student, without regard to the achievement itself.

Criterion: A distinguishing property or characteristic of something, by which its quality can be judged or estimated.

Standard: A definite level of excellence or attainment, or a definite degree of any quality, showing clear / qualitative differences in performance

Standards Referencing and Grade Descriptors

Grade Descriptor: Verbal statement about the general standard to be applied with clearly defined performance standards

Institutional Subject Level Grade Descriptors

Program level Subject Grade Descriptors

Subject level assessment item marking rubrics

The descriptor at institutional/ program level is general, providing a guide to the standards.

They are not necessarily marking rubrics - marking rubrics for each assessment item need to be aligned with a grade descriptor.

Original Institutional Subject Level Grade Descriptor (performance standards not clearly defined)

Subject grade	<i>Elaboration on subject grading description</i>
A	The student's work is outstanding. It exceeds the intended subject learning outcomes in nearly all regards.
B	The student's work is good. It exceeds the intended subject learning outcomes in some regards.
C	The student's work is satisfactory. It largely meets the intended subject learning outcomes.
D	The student's work is barely adequate. It meets the intended subject learning outcomes only in some regards.
F	The student's work is inadequate. It fails to meet many of the intended subject learning outcomes.

Revised Institutional Subject Level Grade Descriptor (performance standards more clearly defined)

Grade	Elaboration on subject grading description
A	by being able to skillfully use concepts and solve complex problems. Shows evidence of innovative and critical thinking in unfamiliar situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner.
B	by being able to use appropriate concepts, and solve problems . Shows the ability to analyze issues critically and make well-grounded judgements in familiar or standard situations, and is able to express the synthesis or application of ideas in a logical and comprehensive manner.
C	by being able to solve relatively simple problems. Shows some capacity for analysis and making judgements in a variety of familiar and standard situations, and is able to express the synthesis or application of ideas in a manner that is generally logical but fragmented.
D	by being able to solve relatively simple problems. Can make basic comparisons, connections and judgments and express the ideas learnt in the subject, though there are frequent breakdowns in logic and clarity. .
F	through a lack of knowledge and/or understanding of the subject matter., Evidence of analysis is often irrelevant or incomplete. 13

PolyU's Policy on Use of Marking Rubrics

“Rubrics must be specified for all ‘major’ assessment items at the subject level, made available to students before the assessment, and used for grading the assessment. Departments have the flexibility to determine what is ‘major’. As a rule of thumb:

- For subjects without examinations, rubrics should be required for single assessment items with a weighting of 30% or above of the subject’s overall assessment.
- For subjects with examinations, rubrics should be required for single assessment items with a weighting of 20% or above of the subject’s overall assessment.”

“To ensure that the rubrics reflect a suitable level of academic standards, samples of the rubrics should be periodically reviewed by:

- Departmental Academic Advisors,
- Overseas Academic Advisors,

as part of the review process during Departmental Review and other periodic visits by these individuals where appropriate.

This being a measure of external benchmarking is not a substitute for internal moderation of assessment processes and results by relevant departmental committees/panels/boards.”

Why rubrics?

- *from the literature*

Andrade, H. G. (2005) Teaching with Rubrics: The Good, the Bad and the Ugly, *College Teaching*, 53:1, 27-31.

Reddy, Y. M. & Andrade, H. (2010). A Review of Rubric Use in Higher Education, *Assessment & Evaluation in Higher Education*. 35:4, 435-448.

- The Good:

(Andrade, 2005; Reddy & Andrade, 2010)

1. Provide consistent and uniform standards for judging student works (*especially when there are more than one assessors!*)
2. Make marking quick and efficient (*after setting up one!*)
3. Help measure higher-order skills or evaluate complex tasks by differentiating the gradations of quality
4. Help teachers to clarify the intended learning outcomes (ILOs) and to appropriate the instructional design
5. Enable clear and consistent communication of the ILOs to students
6. Allow teachers to give students specific feedback with well-defined categories
7. Enhance students' capability in self-learning when used in peer and self assessment
8. Reduce arguments with students who have come to expect how their work will be evaluated

(Andrade, 2005; Reddy & Andrade, 2010)

- The Challenges:

1. Rubrics are not entirely self-explanatory to students.
2. Issues of validity, reliability and fairness apply to rubrics.
 - Not so much about statistical analyses
 - But the consistency and accuracy of the descriptors (e.g. use of adjectives)
3. Initial investment of time in setting up a rubric and in communicating to students can be huge.
4. Students may not want to use the rubric for feedback.



What is a rubric?

Rubric is

- a **common assessment tool** used in higher education.

(Andrade, 2000; Greenberg, 2015;
Reddy & Andrade, 2010)

- a scoring tool that lays out the *specific expectations for an assessment task*.

(Stevens & Levi, 2005)

- a set of clear explanations or criteria used to help teachers and students focus *on what is valued in a subject, topic, or activity*.

(Russell, & Airasian, 2012)

Rubric consists of 4 main parts.

1. Task description aligning with learning outcomes

3. Levels of Performance

- Numerical (i.e. 1-4 or actual points value)
- Qualitative (e.g. unacceptable-basic-proficient-distinguished; novice-apprentice-expert.)

2. Criteria/ Dimensions

Elements that
characterize
performance
of tasks

	1	2	3	4
Criteria 1	• • •	• • •	• • •	• • •
Criteria 2	• • •	• • •	• • •	• • •
Criteria 3	• • •	• • •	• • •	• • •
Criteria 4	• • •	• • •	• • •	• • •

4. Grade descriptors

- Specify the meaning of each criterion
- Describe levels of performance

Scoring Instruments for Performance Assessments

Checklists

Rubrics

Rating
Scale

Analytic
Rubrics

Holistic
Rubrics

Item structure
Rubrics

Holistic Rubrics

- Holistic rubrics score the overall quality, proficiency, or understanding of the specific content and skills without judging the component parts separately.

Task: Write a research report

Level	Description
Limited (1 point)	Project may have a hypothesis, procedure, collected data, and analyzed results. Has several inaccuracies that affect quality of project.
Adequate (2 point)	Project may have a hypothesis, procedure, collected data, and analyzed results. Project not as thorough as it could be; there are a few overlooked areas. Has a few inaccuracies that affect quality of project.
Proficient (3 point)	Project had a hypothesis, procedure, collected data, and analyzed results. Project is thorough and finding(s) are in agreement with data collected. May have minor inaccuracies that do not affect quality of project.

Holistic Rubrics

Advantage and Usage:

1. Quick scoring and provide an overview of student achievement.
2. Use as summative assessment.
3. Use when errors in some part of the process can be tolerated provided the overall quality is high

Shortcomings:

1. Difficult to assign scores consistently, because few students meet one description accurately.
2. Does not yield feedback on students' strengths and weaknesses.

Analytic Rubrics

- Analytic Rubrics provide descriptions at each level of performance regarding what is expected for each criterion

Task: Put up an individual learning portfolio

Criteria	Exemplary	Competent	Developing
Collection & Selection of Artifacts	<p>All artifacts collected and selected demonstrate the program learning outcomes they are intended to measure.</p> <p>All artifacts and work samples are clearly and directly related to the purpose of the portfolio. A wide variety of relevant artifacts is included.</p>	<p>Most artifacts collected and selected demonstrate the program learning outcomes they are intended to measure.</p> <p>Most artifacts and work samples are clearly and directly related to the purpose of the portfolio. Adequate variety of relevant artifacts is included.</p>	<p>Some artifacts collected and selected demonstrate the program learning outcomes they are intended to measure.</p> <p>Some artifacts and work samples are clearly and directly related to the purpose of the portfolio. Limited variety of relevant artifacts is included.</p>
Reflection	<p>Portfolio includes a consistently clear, insightful and comprehensive reflection on, and judgment of, each major step in the project; the reflection describes a substantive and in-depth summary of lessons learned.</p> <p>Documented reflection demonstrates the ability to support a deep understanding of</p>	<p>Portfolio includes a clear and developed reflection on, and judgment of, most major steps in the project; the reflection describes a summary of detailed lessons learned.</p> <p>Documented reflection demonstrates the ability to support a considerable</p>	<p>Portfolio includes a generally clear, and partially-developed reflection on, and judgment of, some major steps in the project; the reflection describes some lessons learned but are brief and superficial.</p> <p>Documented reflection demonstrates the ability to support a partial understanding</p>

Assessment Rubric for Teamwork

Team:

Assessor:

Date:

Category/ Criteria	Exemplary (5)	Competent (3)	Needs Work (1)	Score
Trust	Team members are genuinely open with one another. They always share their weaknesses and mistakes.	Team members are reasonably open with one another. They occasionally share their weaknesses and mistakes.	Team members are not open with one another. They rarely share their weaknesses and mistakes.	
Conflict	Team members actively embrace different ideas and commit to resolving conflicts as they arise. Team meetings are always lively and interesting.	Team members are willing to discuss different ideas and deal with conflicts occasionally. Team meetings are sometimes lively and interesting.	Team members shy away from conflicts and are not willing to discuss different ideas. Team meetings lack energy.	
Commitment	Team members are very clear about the team's direction and priorities and totally committed to realizing the team's goals.	Team members can agree partially on the team's direction and priorities and somewhat committed to realizing the team's goals.	Team members have different ideas of what the team goals are and lack the commitment to move forward as a team.	
Accountability	Team members always put the team's interests ahead of individual interests and keep one another accountable.	Team members attempt to let one another know when individuals do not act in the best interest of the team.	Team members avoid keeping one another accountable for actions and behaviors that would hurt the team's progress.	
Results	Team members always stay focused on team goals, maintain a high level of motivation, and celebrate success along the way.	Team members stay reasonably focused on team goals and can make steady progress towards them.	Team members are easily distracted and lose sight of team goals, resulting in a loss of motivation or lack of progress.	

Analytic Rubrics

Advantage and Usage:

1. Provide specific strengths/weaknesses are desired.
2. Scoring is more consistent across students and grades
3. Provides meaningful and specific feedback along multiple dimensions

Shortcomings:

1. Takes more time to create and use
2. Unless each point for each criterion is well-defined, assessors may not arrive at the same score.

Item Structure Rubrics - quantitative

Grade	Descriptor
A	Able to interpret and identify the underlying logic of the problem, solve the various elements of the problem, bring the various elements together to form a coherent solution to the problem, and to express that solution logically and comprehensively
B	Able to identify all appropriate expression for the solution of the problem and be able to apply all to solve each element of a problem
C	Able to identify all or most appropriate expressions for the solution of the problem, but unable to apply all to solve each element
D	Able to solve a simple problem involving one aspect of a problem only
F	Unable to solve simple problems

Item Structure Marking Rubric - quantitative

$$H(t) = \begin{cases} 1 & \text{if } t \geq 0. \end{cases}$$

[8 marks]

applied

4. (a) Find the equation of the tangent plane to the surface $xy + yz + zx = 5$ at the point $(1, 2, 1)$.

D

[6 marks]

- (b) Consider the function $f(x, y, z) = 4x - y^2 e^{3xz}$.

*used
plots*

- (i) In which direction does f have its maximum rate of change at the point $(3, -1, 0)$? What is the maximum rate of change in this direction?

B C

- (ii) Find the directional derivative of f at the point $(3, -1, 0)$ in the direction $\vec{v} = (-1, 4, 2)$.

D

[6 marks]

- (c) (i) The equation $x^3 + 2x^2yz + \sin z - 1 = 0$ defines z implicitly as a function of x and y , i.e., $z = z(x, y)$. Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$.

C/R

- (ii) Consider now the function $z = z(x, y)$ in part (i) above, and assume in addition that the variables x and y are functions of two other variables u and v :

B/A

*complex
problem*

$$x = \frac{u^2 - v^2}{2}, \quad y = uv.$$

Find $\frac{\partial z}{\partial u}$.

Explain your reasoning Show your reasoning

[8 marks]

5. (a) Consider the function $f(x, y) = \sin x \sin y$ in the square $0 < x < 2\pi$, $0 < y < 2\pi$. Find and classify the critical points of f , i.e., find the saddle points, local minima and maxima of f in $0 < x < 2\pi$, $0 < y < 2\pi$.

Item Structure Rubric - quantitative

Assessment part	Total Marks Allocated	Student A: Good response	Student B: Poor response
4(a)	8	7	5
4(b)	6	5	3
4(c)	6	4	2
Totals	20	16	10

Total marks assigned	Grade Equivalent
0-8	D
9-11	C
12-14	B
15-20	A

When to use rubrics?

Two major considerations:

“A set of clear explanations or criteria used to help teachers and students focus on *what is valued in a subject, topic, or activity.*”

(Russell, & Airasian, 2012)

What to assess for?

“A scoring tool that lays out the *specific expectations for an assessment task.*”

(Stevens & Levi, 2005)

How to assess it?

What to assess for?

- The revised taxonomy by Bloom (2001)
 - ❑ Factual knowledge
 - ✓ by reproduction (*to recognize, recall*)
 - ❑ Conceptual knowledge
 - ✓ by understanding (*to interpret, exemplify, summarize...*)
 - ❑ Procedural knowledge
 - ✓ by application (*to execute, implement...*)
 - ❑ Metacognitive knowledge
 - ✓ Analysis (*to differentiate, organize...*)
 - ✓ Evaluation (*to check, critique...*)
 - ✓ Creation (*to generate, plan, produce...*)

How to assess it?

- Common assessment tasks

- Class participation
- Group project
- Presentation
- Reflective Journal
- Short Answer Question
- Essay
- Portfolio
- Poster
- Case Study
- Practical (labs, field study)
- Reading Report
- Quiz
- Exam (Final, Mid-term)
- Clinical Exam
- Oral Exam
- Open Book Exam
- Other, please specific: _____

Workshop Series on Developing and Adopting Marking Rubrics in Relation to Assessment Types

Part 2: Assessment tasks and Marking Rubrics

- 13/11/2018, Tue – for MCQ, Presentations & Reports
- 15/11/2018, Thu – for Essays / Long Questions, Short Questions

Bring your own subject assessment task and rubric!!

Resources

- Examples of Grade Descriptors @ HKU
https://ar.cetl.hku.hk/grade_example.htm
- AACU's VALUE Rubrics (16 Assessment Rubrics)
<http://www.aacu.org/value/rubrics/index.cfm>
- More examples of rubrics
<http://ias.virginia.edu/assessment/outcomes/tools/rubrics>