Using rubrics to engage higher-order thinking and higher quality learning outcomes

Authentic assessment

Student-focused approach to teaching

Deep approach to learning

Learning outcomes

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Teaching and Learning Support
The aligned curriculum: an outcomes-based approach

- Curricula specify what students are expected to learn and the level of learning.
  
  - Unit Learning Outcomes (LOs)*
  - Graduate Attributes*
  - Course Outcomes
  - Content Knowledge

- **Constructive alignment**

  - Arrangement of curriculum and assessment to enable students to achieve Intended Learning Outcomes
Learning outcomes

• **Learning outcomes** have three dimensions:
  1. **Knowledge** – what a graduate knows and understands
  2. **Skills** – what a graduate can do
  3. **Application** – applying skills and knowledge (context)

• What students should be able to do (performance) by the end of the unit within the context of the subject content.
  
i.e. critically evaluate, conduct research, understanding, problem solving

• **Assessment criteria** assess the level of competence and achievement of the learning outcomes.

• **Assessment** is the performance of understanding.
Improving assessment and students understanding of assessment processes

UNE’s Assessment Policy

• 2.2. Assessment enables students to demonstrate progress towards attaining learning outcomes (LOs)...They [LOs] should:
  
• a. clearly **communicate** the type and depth of learning students are expected to achieve.

An **assessment rubric** is a means of enhancing the communication of learning outcomes to students, unit coordinators and teaching teams.

• A rubric is an assessment tool that describes and scores observable qualitative differences in performance against a set of criteria.
Assessment rubrics

- A Rubric has three essential features:

- **Evaluation criteria**
  - Factors to determining the quality of a student’s work.
  - Provide clarity to the student, e.g. critical thinking, problem solving.
  - Student can self-monitor performance against criteria and discriminate between performances, and reflect on process of learning.

- **Quality definitions**
  - Detailed explanations (descriptors) of what the student must do to demonstrate level of achievement.
  - Five levels at UNE: Higher Distinction, Distinction, Credit, Pass and Fail.
  - Language that is easily understood by students.

- **Scoring strategy**
  - The use of a scale for interpreting, and judging a product and/or process.
  - ‘Holistic’ rubrics enable the scoring of the outcome as a whole
  - ‘Analytic’ rubrics use a scoring strategy, each criteria scored separately and overall aggregation to form a score

Rubrics: the basics

- **Analytic rubrics**
  - Use a scoring strategy – each criterion is scored separately for eventual aggregation to form an overall score.

### Quality definitions

<table>
<thead>
<tr>
<th>Exemplary</th>
<th>Proficient</th>
<th>Basic</th>
<th>Progressing</th>
<th>Underdeveloped</th>
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**A. Ethics proposal description / introduction**

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<tr>
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<tbody>
<tr>
<td>a. Background to the problem.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>b. General research problem or question motivating study.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>c. Aim(s) of study.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>d. Variables/major assumptions and/or definition of terms.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>e. Relevance to your field of interest or cross-disciplinary interest explained.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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**Overview of research**

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<tbody>
<tr>
<td>f. Form provides appropriate amount of information.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>g. Process involved and time commitment explained.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>h. Contact information for researchers and HREC evident.</td>
<td>5</td>
<td>4</td>
<td>3</td>
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**Research methods and procedures**

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<tbody>
<tr>
<td>i. Type of research design.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>j. Rationale for method/design selection.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</table>

**Marker’s special comments**

Well done. Overall this application provides basic coverage of the study. The general idea of the proposal comes through, but requires much more specificity. There is much scope to refine the idea of intercultural competence and culturally aligned teaching. Additional detail in this area is strongly required and more specific identification of the phenomenon under investigation is a prerequisite to this. This will enable you to widen the literature base and provide a sound supporting case. For example, more contextual information should be provided about the types of culture that are likely to be encountered. In the methodology section, detail on the...
Rubrics: the basics

- Holistic rubrics
  - Scoring of process or product as a whole – without allowing for judging of component part separately.

<table>
<thead>
<tr>
<th>Objective/Criteria</th>
<th>Fail (Less than 50%)</th>
<th>Pass (50% and 64%)</th>
<th>Credit (65% and 74%)</th>
<th>Distinction (75% and 84%)</th>
<th>High Distinction (85% +)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of analysis of own views</td>
<td>Describes own views on the situation with limited or no depth.</td>
<td>Describes personal view on the situation at a surface level with general descriptors of reasoning and justification.</td>
<td>Effectively describes specific personal perspectives, articulating rational and around justification/reasoning.</td>
<td>Effectively selects and articulates key frames of viewing illustrated with examples recognizing complex contextual factors.</td>
<td>Meaningfully justifies personal frames of viewing using sophisticated reasoning and logic in relation to the sources of evidence available.</td>
</tr>
</tbody>
</table>
How achieved learning outcomes are related to different approaches to learning

Reading a text, listening to a lecture, engaging in a group task and so on.

Approach to learning (contextualised)
- Student’s epistemology
- Perceptions of the context
- Teacher’s teaching mode
- Nature of the assessment
- Motivation

Deep – intrinsic curiosity
- Examining new facts and ideas critically
- Looking for meaning, making connections
- Linking course content to real life

Strategic – achievement oriented
- Strategic assessment of learning content
- Acquiring broad understanding of key concepts
- Taking ‘learning’ cues from lecturers

Surface – little interest in subject
- Receiving information passively and uncritically
- Facts and figures stored as isolated, unconnected items
- Units and modules treated as separate

Relational experience

Higher Quality LOs

Lower Quality LOs
Assessment rubrics: Affording deep learning

- How do we encourage deep learning?
  1. Use descriptors/criteria to guide students in their study

- What represents higher order thinking?
- What represents lower order thinking?

2. Building in higher order thinking into assessments tasks and linking this to the higher levels of the assessment rubric. Promoting the construction of knowledge by:

- Using different assessment types to encourage deep learning
- Using different teaching methods (strategies)
  - i.e. research-informed teaching (research-based)
Sequencing learning for assessment

1. **Teaching & Learning Activities** - seminars, tutorials, individual tutorials, online discussions
   - Designing structures that afford quality learning experiences and encourage deep learning
   - Sequencing of types of activities and interactions to progress learning towards more complex understandings e.g. Biggs’s SOLO taxonomy

2. **Rubrics** can also help encourage higher order thinking and quality LOs – critical thinking, critical reflection, analysis, synthesis....

   - Thinking frameworks can also be used to structure rubrics

**Bloom’s taxonomy** can be used to classify learning objectives by qualitatively different ways of thinking

The **SOLO Taxonomy** can be used to classifying LOs in term of complexity
Designing learning: SOLO
increasing complexity in a student’s understanding of a subject

Students are simply acquiring bits of unconnected information, which have no organisation and make no sense.

Prestructural

Simple and obvious connected are made, but their significance is not grasped.

Unistructural

Surface learning

Newton’s law of universal gravitation

\[ F = G \frac{m_1 m_2}{r^2} \]

\[ F_1 = F_2 = G \frac{m_1 \times m_2}{r^2} \]

A number of connections may be made, but the meta-connections between then are missed, as is their significance for the whole.

Relational

Multistructural

Deep learning

Extended Abstract

At University set questions should invite an extended abstract response

The student is making connections not only within the given subject areas, but also beyond it, able to generalise and transfer the principles and idea underlying the specific instance.

The student is now able to appreciate the significance of the parts in relation to the whole.

The student is making connections not only within the given subject areas, but also beyond it, able to generalise and transfer the principles and idea underlying the specific instance.
Learning = change in understanding and realignment of the individual with world, represented as a performance capability.
Quality definitions: what are you looking for?

- Take one of the assessable components of a learning outcome and consider what you are looking for in student’s work to evidence each grade?

- How would you differentiate between different levels of outcomes/performance when assessing? What are the **three** key (differentiating) features of each grade?

<table>
<thead>
<tr>
<th></th>
<th>Higher Distinction</th>
<th>Distinction</th>
<th>Credit</th>
<th>Pass</th>
<th>Fail</th>
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</thead>
<tbody>
<tr>
<td><strong>Group work:</strong></td>
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<tr>
<td>critically discuss</td>
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<tr>
<td><strong>Writing or problem task:</strong></td>
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<tr>
<td>demonstrate knowledge and understanding</td>
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<td><strong>Multimedia task:</strong></td>
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<td>Proficiency in oral communication</td>
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<tr>
<td><strong>Examination:</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apply recognised methods of science</td>
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<tr>
<td>Responsibility for learning</td>
<td>Independent Group work</td>
<td>Independent learning</td>
<td>Learning by doing</td>
<td>Problem-based learning</td>
<td>Reflection</td>
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<tr>
<td>Student ownership and peer-peer learning</td>
<td>Student autonomy and choice over subject matter</td>
<td>Experiential learning – concrete experience of real-world tasks</td>
<td>Tackling relevant subject problems - students identify subject matter</td>
<td>Student ownership - experience turned into learning</td>
<td>Student’s ownership and active learning</td>
</tr>
</tbody>
</table>

| Motivation | Interaction is motivating, encouraging range of learning activities | High student motivation and ownership | Involved, active and motivated | Knowledge discovered through learning – generates motivation | Learner activity, motivation to deep learning | Highly motivating - extent of choice & responsibility, assessment |

| Knowledge | Co-construction of knowledge and application | Student plans learning – discovering knowledge | Awareness of existing knowledge base | Integration of knowledge – Active process of learning enhances knowledge base | Application of prior knowledge, requires sound knowledge base |

| Activities | Accompanies problem-based learning, student-led seminars etc. | Self & peer assessment, project work, negotiated tasks | Games, simulations & role-play, practical work etc. | Interaction – group work, co-operative learning | Diaries, reflective journals, video, observation etc. | Often end of study project, dissertations |
# Achieving Learning Outcomes

<table>
<thead>
<tr>
<th>Critically discuss</th>
<th>Demonstrate knowledge and understanding</th>
<th>Proficiency in oral communication</th>
<th>Apply recognized methods of science...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion participation – structured participation in an online or classroom discussion</td>
<td>Multimedia task e.g. portfolio, video</td>
<td>Presentation or demonstration – including languages, theater etc. or demonstration of practical skills</td>
<td>Writing or problem task e.g. laboratory report</td>
</tr>
<tr>
<td>What are you looking for?</td>
<td></td>
<td></td>
<td>What are you looking for?</td>
</tr>
<tr>
<td>Examination – conducted as per university policy</td>
<td>Self-test or progress test - generally conducted online</td>
<td>Multimedia task e.g. portfolio, video</td>
<td>Group task – final work graded as a group</td>
</tr>
<tr>
<td></td>
<td>What are you looking for?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group task – final work graded as a group</td>
<td>Writing or problem task e.g. essay, laboratory report, creative writing</td>
<td>Discussion participation – structured participation in an online or classroom discussion</td>
<td>Examination – conducted as per university policy</td>
</tr>
<tr>
<td></td>
<td>What are you looking for?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fostering deep learning: Authentic Assessment

- **Graduates:**
  - Know a body of knowledge (widened beyond the given content?)
  - Developed a set of skills (does this mean mastery?)
  - **Can apply these in a ‘real life’ situation and can solve real life problems** [not necessarily a real-world setting].

- Authentic assessment is performance-based where graduates demonstrate the extent of their learning through demonstration of mastery [at degree level].

  - Can encourage: critique, reflection, social awareness,
  - Can drive the curriculum (not all areas) as it requires students to widen their content knowledge beyond the required readings
  - Encourages a shift from surface to deep learning
  - Translate from traditional to non-traditional forms of assessment
Encouraging deep learning and innovation

Students choose types of learner and diversity – active learning

Innovation and creativity requires higher-order non-routinized thinking

Unpredictable nature of the lesson/learners and peer feedback, non-routine requires adaptation signifying ‘mastery’

Higher level LOs require research beyond required reading

Research-based inquiry learning

Integrating professional and academic knowledge

<table>
<thead>
<tr>
<th>Tutor:</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic:</td>
<td></td>
</tr>
</tbody>
</table>

**Assessment criteria**

<table>
<thead>
<tr>
<th>Lesson presentation</th>
<th>Minim evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well designed, planned and paced lesson meeting the individual needs of learners and diversity of the classroom</td>
<td>(1-5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reasoning of lesson design</th>
<th>Minim evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity and logic of reasoning behind lesson design in regard of learner difference and diversity</td>
<td></td>
</tr>
<tr>
<td>Clarity and accuracy in conveying key theories/concepts &amp; teaching philosophy to the viewer</td>
<td></td>
</tr>
<tr>
<td>Inventiveness in application of theoretical perspectives to lesson design</td>
<td></td>
</tr>
<tr>
<td>Range of relevant and up-to-date sources referenced; theory, research, policy and other</td>
<td></td>
</tr>
</tbody>
</table>

Autonomy over design and delivery, responsibility for designing LOs for the lesson
Establishing reliability and validity of the rubric

- The rubric isn't the beginning it’s the end
  - Expect to draft several versions and go through several iterations of development and revision (plus the assessment task).

- Testing the rubric on a pilot sample of student work or colleagues – feedback used to revise the rubric
  - This can be difficult if you have decided to change the assessment this academic year.

- Inter-rater reliability – where input is provided from a marking team there is likely to be greater validity and reliability.
Strategies for gaining consensus on evaluative criteria

- Consensus amongst the teaching and marking team
- Development and description by interdisciplinary team
- Use of sample assignments
- Consensus amongst students
- Involving student in designing and writing criteria