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Improving assessment: Rubrics in a tertiary multimedia course

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Abstract: This paper explains how alternative assessment methods were implemented in a first-year tertiary course on web design. The aim was to make assessment clearer for the students to understand, and more focussed, using a rubric—a detailed, criterion-referenced marking guide. The results of a post-course evaluation of this action research showed that students strongly appreciated the use of this type of assessment. Our conclusion is that the rubric approach improves student satisfaction and can save lecturers time when marking.

Introduction

Assessment is a critical part of the learning cycle in a tertiary institution, but is sometimes treated as an extra burden rather than an integral part of course design. In addition, at a time of increasingly constructivist orientations in course design and presentation (eg. Duffy & Jonassen, 1992), course designers are reviewing their instructional regimens yet ignoring their assessment techniques. This misses the opportunity to make the linkage between assessment and instruction 'more natural, ongoing, and constructive', (Tierney, Readence, & Dishner, 1995, p. 482). Rubrics are part of a trend towards a greater variety and more authenticity in assessment. By integrating assessment into their instruction educators are both servicing their students better and making their teaching more satisfying (Yell, 1999).

Assessment has both summative and formative purposes ⊱ the summative purpose includes providing grades and feedback to students after the learning cycle. The formative purpose can enhance learning during a course, for example using rubrics:

> *Highly competent teachers use assessment measures to inform their instruction and … as a means of instruction. Rubrics are frequently the tools used to identify key elements of proficiency [in that instruction].… These rubrics assist both the teacher and the learner in determining the necessary elements for each level of performance. (Skillings & Ferrell, 2000, p. 452)*

There is often a conspicuous discrepancy between the student-centredness of some courses, and the isolated nature of their assessment. As Skillings suggests, changes towards more student-friendly assessment can improve learning. In fact the evidence that a rubric⊱a structured, elaborated appraisal tool⊱can lead to greater student participation, greater satisfaction for the instructor and better student performance, is the reason for the action research reported in this paper.

All about rubrics

A rubric is sometimes called a marking guide or a scoring guide. In cynical mode Popham (1997) argues that the name was carefully chosen because of its decisive lack of opacity, since less opaque descriptors like scoring guide are therefore less technically attractive. There are many differing definitions of rubrics and their usage (Brudnak, 1998; Wenzlaff, Fager, & Coleman, 1999), nevertheless there is still some agreement on the content (Morgan, 1999). As ways of assessing student work have begun to change, rubrics are becoming increasingly popular. They are sufficiently popular in schools that they are now mandated by education departments across parts of Australia, UK and educational districts in the US, at both class and system level.

In its simplest form a rubric is a rating table which allows comparison of student work against important content listed in a table (Tab. 1). The essential characteristics can be summarised as follows:
- a set of content or standards which are being assessed ⊱ here arranged in rows;
- a set of levels of proficiency, for example from beginning to developing through to accomplished (see columns in Table 1), or even sad to neutral to smiley faces;
- each level contains specific, measurable performance characteristics, such as 'made regular/ some/ few pauses to check notes'; and
- any descriptor used in any cell should normally appear in all cells on that row – in a 'good' rubric there should be no hidden skills that magically appear (or disappear) as the level changes, under normal circumstances.

Level > Content items v	Beginning (C to CR)	Developing (CR to D)	Accomplished (D to HD)
Use of notes in public speaking	☐ made regular pauses to check notes	☐ made some pauses to check notes	☐ made few pauses to check notes

Table 1: Rudimentary example of a rubric for rating Notes Use in some public speaking activity

Some parts of the rubric are flexible. It is possible to have either detailed descriptors or checklist items in each cell; and the number of rating levels (three are used here) can range up from two, though less than six is strongly recommended (Schincariol & Radford, 1998).

Other parts of the rubric are less flexible. For example notice that the rating scale is not normative, like 'Good, Better, Best', but is explicitly measurable. The intention of the rubric is to rate student performance against some standards rather than simply comparing them with their peers. Creating rubrics is both an art and a science—just like all teaching—and a number of writers describe the detail of how rubrics can be developed (eg Montgomery, 2000; Morgan, 1999; Rose, 1999; Yell, 1999)

Assessment based on performance has become a popular alternative to traditional assessment (eg pencil and paper) in recent years, particularly with complex and subjective criteria (Schincariol & Radford, 1998). Instead of taking a traditional test with right and wrong answers, students are asked to demonstrate a skill eg perform an oral presentation, create a web page or design a rubber-band-powered vehicle. These efforts cannot be graded by counting right and wrong answers, and that is where rubrics are powerful. They simplify appraisal in situations more closely resembling 'real life' than less authentic and isolated traditional tests. Unlike traditional marking keys, rubrics are provided before rather than after any student assessment point, and are intended to be a unified part within a teaching program. Rubrics are therefore public, composed of clear measurable language and integral to the learning process.

The role of rubrics in learning

Because rubrics convey clearly and explicitly what is expected in terms of content and performance standards (Rose, 1999, p.30), they are a useful and motivating assessment tool. But Germaine (1995, p.1) argues that rubrics can also be powerful teaching tools, since they:

> promote unanxious expectations; make grading criteria known to students; drive curriculum and pedagogy; reduce teacher subjectivity; ensure accountability; and maintain focus on content and performance standards and student work. (p.1)

Students given explicit, embellished, measurable guidelines for their assessments are working on the outcomes that have already been determined as important for their success, and that focus can improve their learning effort considerably. They also provide clear guidelines for the course instructor and hence focus the teaching directive (Rose, 1999).

Traditional marking keys are the hidden runes whose contents students guess at, whereas rubrics are public. This has a two-edged benefit, namely students can evaluate the evaluating tool before it is used on them. Hence students can now think and talk about their assessments, and even examine their own expectations and standards. Such metacognitive actions extend the role of rubrics as powerful tools for learning (Skillings & Ferrell, 2000, p.455). Furthermore, as writers like Abbott (1997) have pointed out, metacognition supports the transferability of these skills to other, different learning situations.

A rubric would appear to have a particular advantage over less elaborated methods of assessment for nonnative language speaking students. The repetition of language in the rubric and clear development of conceptual levels across a rubric table mean that there are more opportunities for language pattern recognition than occur in a narrative or unstructured assessment format. In fact such improvements, eg in motivation for weak students, have already been noted in school environments (Custer, 1996; Skillings & Ferrell, 2000).

It is possible to integrate rubrics further into the teaching and learning process. Much of the literature on rubrics talks of a student role in their design. There is merit in involving students not just in the fine-tuning but the total design of their assessment rubrics because of the evident value engendered by their participation, argues Stiggins (1997):

> Involving students in the development of performance targets can be an effective instructional tool because students who are given the task of analysing quality work and its crucial components become better performers themselves. (p. 452)

Rubrics advantages are not without a price. Firstly they still only address only a part of the spectrum of student performance and should not be overrated. Although they appear to have broad educational justifications, they are not a replacement for a rich appraisal program says Yell (1999). Nevertheless he also points out that educators will find more and more uses for them as their proficiency improves. Secondly Wenzlaff et al. (1999) argue that there is no 'best' format for a rubric, and that "perhaps there should not be" (p. 43), which might explain why some teachers seem to 'fine-tune' their rubrics endlessly. They point out that the expertise of the user is at least as important as the actual rubric format. Still, if a rubric focuses an instructor's attention on course-relevant processes and performances, then time spent fine-tuning is easily justified.

Thirdly students who meet rubrics for the first time can find them overwhelming and even confusing. 'I liked the idea but as a "first off", was not clear about its purpose until assignment 2', complained one student. We realised in hindsight that rubrics need even more careful introduction than we expected.

Fourthly, because they tend to be standards-oriented rather than normative, rubrics represent a shift in philosophy from the traditional norm-referenced methods. In fact rubrics are not intentionally a grading system but simply a way of identifying weaknesses and strengths. It is true that a student who scored, say, 'Accomplished' on all criteria could argue that they deserved a high grade, but this is a trivial example. After all, grading students whose marks are extreme is always much easier than grading the rest. The issue of grading is critical because if the rubric is to be useful in a tertiary setting, it must allow marks to be compressed somehow into a single grade. Our method uses the principle of 'conjoint progress' ⸢ no student should be awarded, say, a D (for distinction) unless they had satisfied all the criteria for the D in all the content areas. In other words there should be no 'averaging out', just as making a cup of coffee cannot be averaged⸢missing a single step, eg 'adding a teaspoon of coffee' fails to complete the act of making the cup of coffee.

Consider three students S1, S2 and S3, whose three marked rubrics look like the table below (Tab. 2). The table uses blocks to represent cells from a rubric. For example, a row which consisted of a single filled block would represent a Beginning Level performance for that student, eg S2 on Criterion 3. Multiple filled blocks mean improved levels. The likely grade for S1 is the same as S2 and S3, since none have conjointly made progress of more than one cell to the right. Whilst S2 and S3 are clearly better than S1 in some areas, overall each has a weakness in a critical area already identified by the rubric, which undermines their overall 'value' (perhaps employability). So, in this case, all these students should be awarded the same grade.

	S1	S2	S3	
Criterion 1:	■□□	■■□	■■■	Key
Criterion 2:	■□□	■■■	■□□	■ = ✓
Criterion 3:	■□□	■□□	■■■	□ = ✗

Table 2: The 'conjoint progress' principle allocates students S1, S2 & S3 the same grade (see text).

In essence, then, rubrics provide a way to improve the meshing between the appraisal and teaching parts of the learning process. So called 'objective tests' require effort in their construction, but can speed marking. Similarly rubric development can be laborious but it can reduce the qualitative dilemmas at marking time, especially when considering performance-based measurements. As well as guiding and motivating the learner, their detailed structure is helpful for weaker students. Also, they serve as an elaborated reminder of the instructor, and there is evidence that they support metacognition and transferability of thinking skills as well. Novices will find, as we did, that their skills improve with use. Their advantages need to be weighed against the effort of construction, the need for explanation, and the likelihood of continual fine-tuning. Our conclusion was that a satisfactory assessment rubric would therefore meet six criteria, listed below (Tab. 3).

1	An n x 3(?) table of Standards (Rows?) against Levels of proficiency (3 columns?)
2	Contain specific, measurable performance characteristics in each level
3	That a descriptor appearing in any row ought appear in all or most cells on that row
4	Be available well beforehand so as to guide the learning as well as the assessment
5	Be student-constructed or at least student-adjustable
6	Be amenable to some marks compression process ie to produce a grade

Table 3: Rubrics Criteria ⸢ derived design criteria for a satisfactory rubric

Action research case study

IMM 1122 'Publishing on the Web' is a first year elective in a course for students studying multimedia at Edith Cowan University in Western Australia. It has around 110 enrolments each year, covers introductory html, web pages, site design, and

introduces vector graphics enhancements using Flash™. This unit was designed by the staff involved for the first semester of 2000. All the resources and an on-line bulletin board were made available via the unit web-site. At the first lecture, students were introduced to all aspects of the course, including the concept of an assessment rubric for their two assignments. The rubric was made available on the unit web-site some weeks before each of the two assignments. It was planned to provide it earlier, but it proved challenging for novices to construct, and satisfying to keep adjusting.

In an attempt to involve the students in the process of rubric design, assignment one had two submission dates, a week apart. Initially a paper design and their personal extensions to the standard rubric were sought. A week later the final electronic assignment was due in, to be marked according to the initial rubric as well as their additions to the rubric. A printed version of the rubric was used to mark their assignment—see extract below (Tab. 4).

Since each cell of the rubric was composed of mainly exhaustive criteria (eg:' ☒ at least one working image map') rather than examples, it was decided assignment two's rubric should include a summative item in each cell, saying ' ☒ meets criteria for lower rating' (see bold text in the right hand cells of Table 4). This had two consequences. First it meant that there was less repetition needed across the cells. Although this contravened one of the Table 3 rubrics' criteria, it also made it a more manageable size. Secondly it meant a marker could make a rapid judgement more readily during the grading process.

	Beginning - C to CR	Developing – CR to D	Accomplished – D to HD
Web Page Widgets (10 marks)	☒ Form/s: reset, buttons work ☒ Correct use of HTML table tags, incl. captions, borders, cell spacing ☒ At least two list types ☒ Working frameset & frames etc	☒ **Meets 'Beginning' criteria and…** ☒ Simple working JavaScript eg. inside tags ☒ Working Mailto: tag or form Mailto: ☒ FTP or file download (eg. mov, wav) provided ☒ Clear variable names in pages, frames, forms ☒ etc	☒ **Meets 'Developing' criteria and…** ☒ Variety of JavaScript eg. status bar, use of date fields, browser name, etc ☒ Makes allowances for browsers without JavaScript ☒ Data Validation in forms etc
Web design (10)	☒ etc ☒ etc	☒ **Meets 'Beginning' criteria and…** ☒ etc ☒☒	☒ **Meets 'Developing' criteria and…** ☒ etc ☒☒
Content (4)	☒ etc ☒☒ ☒☒	☒ **Meets 'Beginning' criteria and…** ☒ etc	☒ **Meets 'Developing' criteria and…** ☒ etc

Notes. comments, strengths, weaknesses etc: F C CR D HD Approximate mark and grade (circle one set): 15+ 18+ 21+ 24+

Table 4: Extract from the Assignment 1 rubric, with summative entries in bold text in the right-hand cells.

It was realised that the checklist rubric approach would allow either a detailed marking scheme or an impressionistic global one. The detailed one simply added ticks, assuming, quite unreasonably, that the items were of equivalent value. The global marking method was supported by noting the volume of ticks in each cell and making a judgement about progress towards the higher ratings. Tutors were free to use either format for marking, within the constraints of the principle of conjoint progress, described above. Students were reminded of the mastery principle with the anecdote about flying with the pilot who passed, with 50%, by scoring 100% of her take-offs and scoring 0% on her landings. By making this issue clear beforehand, it was felt that some potential misunderstandings were avoided.

Student feedback

All students at their first practical class were asked to complete a short pre-course questionnaire and at the last practical class were asked to complete a similar post-course one (35 collected). It is not possible to ascertain the views of those from whom no form was received, which includes those who chose not to attend the practicals, but we can think of no abnormal reasons for their lack of data to skew the results we report here.

Students were asked to rate a range of questions from 0 (low) to 10 (high); and were then given space for a comment. The average rating for the rubric idea was 7.1 and pleasingly the most common score was 10. Almost 80% of students rated the idea of using a rubric at a 6 or better, whilst 17% rated it from 0 to 4. Their rating for the course overall was similar, with 7.2 as the average satisfaction rating.

The range of positive responses ranged from observations like 'helpful' (with a rating of 7), to 'great idea' (with a rating of 10). A further sampling of their ratings and their associated comments follows:

6 Good idea, very helpful (if you use it)
8 I think it works well in a lot of ways
8 Good, I could check off things as I did them
7 Good for those who had NO idea (what was wanted)
  8 Really gives you good indicator of what to include in the asnt instead of just guessing

It appears that some understood it better than others, but their judgements are largely supportive. Although one comment in the list suggests a student who was taking a rather mechanistic and unthinking approach ('I could check off things'), it is nevertheless true that they are working on priorities which the rubric writers have already identified as important. Without such a list they might not have any confidence that they were addressing consequential topics in their assignments.

It would be improper to ignore poor evaluations, as they are the students that have to be 'turned around' for assessment averages to improve. Here are comments from the (fewer) negative evaluations:

1 Criteria far too high for a 1st year unit
1 Didn't know about it until the second assnt
0 Pointless since you do not evaluate according to a criteria but rather one student against
  another
2 Makes it more mechanical and less creative - you just put stuff in for marks

It is sometimes harder to summarise negative comments than positive ones, as there are many reasons for the state of dissatisfaction but all satisfied people are in approximately the same ⎱ie satisfied⎰ state. Two observations are in order. Student 3 seems to have made a philosophical judgement that is at odds with our stated aims. As before, there is a student (#4) with no interest in the rubric as a learning tool, and sees it as simply an elaborate checklist. Allowing such students more say in the content of the rubric (criterion 5 in Tab. 3) may address this concern. Overall it would seem that scrupulous explanations may improve student understanding, when introducing rubrics concepts.

Our attempts to allow students a more significant role in the extension of the rubric, though laudable, were judged as unsuccessful. At marking time, we found we were 'juggling' both the assignment rubric and the assignment itself, which we rated as unsatisfactory. Until we feel greater confidence in the use of rubrics, we sense that such a facility needs to be treated differently. Fortuitously the second assignment had only one deadline, and tutors rated this as preferable, feeling that it had not seriously undermined the extra value that the rubric had brought to the unit.

The completed rubrics were handed back to students with their assignments. Student comments after each assignment indicated general contentedness, and later strongly supported the approach, but there were some concerns by the students about tutors' ability to use them properly. For example in the course evaluation one student commented, 'useful, but my tutor did not seem to mark by it, so rather pointless'.

Conclusions and recommendations

This paper demonstrates one way that tertiary courses can successfully utilise less instructivist approaches to assessment. The identified Rubrics Criteria (Tab. 3) were implemented with relative ease, especially after experience gained designing the first rubric. Although it seems that the rubrics concept needs careful utilisation, both to improve staff skills in its implementation as well as student understanding in its use, its robustness is comparatively obvious.

It appears that students enjoyed this unit's use of rubrics, although it was the first time they had seen such a device and even though it caused some difficulty for a small number of students. The strong balance of student support for the rubric concept and their overall satisfaction with the course suggest that the rubrics were a helpful part. Indeed, we assert that the rubrics helped many students better focus their effort on the delineated criteria in this unit on web publishing.

Eventually we envisage both staff and students having better procedural and conceptual understandings of rubrics. Immediate improvements could include better introduction of the rubric and its role; a tutorial activity where the students jointly mark some provided representative work samples; we can imagine students reviewing the unit's rubrics (displayed on a web-site) and suggesting improvements and additions—this might be handled by providing a specific on-line bulletin board on the topic, perhaps even for marks.

Change processes like this take time and need review, so it was ironic to read one of the criticisms of rubrics was that they encourage fine-tuning. We argue they warrant continued refinement, since they are as satisfying to the educators as they are educationally useful to the students involved. The reason is that rubrics can precisely centre your attention on what is and is not important.

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