

## Rubrics as a way of providing transparency in assessment

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This paper reports on a study where rubrics have been used to convey assessment expectations to students ( $n = 176$ ) in three different assessment situations in professional education. These situations are: (1) the development of a survey instrument, which was part of a course in statistics and epidemiology; (2) an inspection of a house, which was part of a course about the functions of buildings for real estate brokers and (3) a workshop in communication with patients, which was part of a course in the evaluation of diagnostic procedures and treatments of oral infections in dental education. In all situations, students' perceptions and uses of the rubrics were investigated. Findings suggest that it is indeed possible to convey expectations to students through the use of rubrics, in the sense that students not only appreciate the efforts to make assessment criteria transparent, but may also use the criteria in order to support and self-assess their performance. Important features of the rubrics, which were found to facilitate students' understanding and use of the criteria in these situations, are presented and discussed.

**Keywords:** assessment; professional education; scoring rubrics; transparency

Student awareness of the purpose of the assessment and assessment criteria is often referred to as *transparency*, and Wiggins (1998) argues that, in order to educate and improve student's performance, all tasks, criteria and standards must be transparent to both students and teachers. Indeed, transparency has been shown to be important for the students, not least since many believe that not knowing what is expected of them has a very negative impact on their learning (Wiiand 2005). Some researchers (e.g. Baartman et al. 2006) have therefore argued that assessments – if they are to be considered valid – should include means to provide transparency as a way to promote learning of the same skills that the assessment was intended to capture (cf. the 'backwash effect' described by Biggs 1999).

Provided that transparency is accepted as a means for enhancing student learning, the next question is how to communicate the expectations to the students. As has been illustrated by Orsmond and Merry (1996), interpreting criteria is difficult, especially for novices (like students). In one of their studies, criteria like 'a clear and justified conclusion' were so alien to the students that they were not able to recognise such a conclusion, even though it was described to them by the instructor. In another study by the same authors, students worked in pairs on a performance task. It was assumed that the students would discuss and come to a shared understanding of the criteria, but this assumption could not be confirmed (Orsmond, Merry, and Reiling 1997).

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A similar situation has been reported in research on students' use of feedback, where the fact that students do not understand the feedback they receive is a major concern. Although one part of the explanation for students' lack of understanding could be attributed to illegible writing, which seems to be a common problem, the real challenge lies in teachers' use of academic terminology or technical jargon. As shown by this field of research, many students have problems understanding the meaning of the terms that teachers use, or the criteria that teachers make reference to, even when effort has been made to clarify the discourse (for an overview, see Jonsson 2013a).

Scoring rubrics, which have been advocated as a means to provide transparency, are also affected by the same problem. This is most clearly demonstrated by studies investigating conditions in which students receive a rubric, but not any (or only minimal) training in using the rubric. Typically, the effects on student learning in such conditions are none, small or only partial (Jonsson and Svingby 2007; Panadero and Jonsson 2013).

Obviously, even if transparency may be considered desirable in order to promote student learning, it does not seem to be easily attained. On the other hand, efforts to increase transparency are almost unanimously appreciated by students, and in research on rubrics the perception of clarified expectations by students is a major theme (Jonsson and Svingby 2007). Typically, students claim that using rubrics helps them to focus their efforts, produce work of higher quality, earn better grades and feel less anxious about assignments (Reddy and Andrade 2010).

Adding to the seemingly paradoxical situation described, where students appreciate being given explicit criteria, even if they do not necessarily understand them, there are a number of investigations reporting about greatly improved student performance as a result of clarified expectations through the use of rubrics (e.g. Jonsson 2010; Schamber and Mahoney 2006). Obviously, the rubrics must somehow provide at least some transparency to the students, so that they are able to meet the requirements set by the teachers or researcher in these studies. As noted by Panadero and Jonsson (2013), however, most studies reporting on such improvements have combined the use of rubrics with other instructional interventions. This means that there is more substantial evidence suggesting that rubrics can facilitate improvements if combined with self-assessment or other meta-cognitive activities, but there is quite limited evidence supporting the claim that the use of rubrics can in itself lead to improvements in performance.

As suggested by research on rubrics (e.g. Balan 2012), there is a reciprocal relationship between the transparency provided by rubrics and activities where students actively make use of the criteria, such as using feedback or self-assessment. While at least some level of transparency may be considered a prerequisite for interpreting feedback or working with self-assessment, the interpretation of feedback and the work with self-assessment feeds back to the transparency, so that students' understanding of the criteria increases, which provides even better conditions for working with the rubric, and so forth (Figure 1).

It has been argued that students need to be aware of what is expected of them, if they are to adapt their learning strategies to the assessment requirements and improve their performance. However, providing transparency to students is difficult, since many students have problems understanding the meaning of the terms that teachers use, or the criteria that teachers make reference to. As a consequence, sharing rubrics with students without combining the use of rubrics with other activities

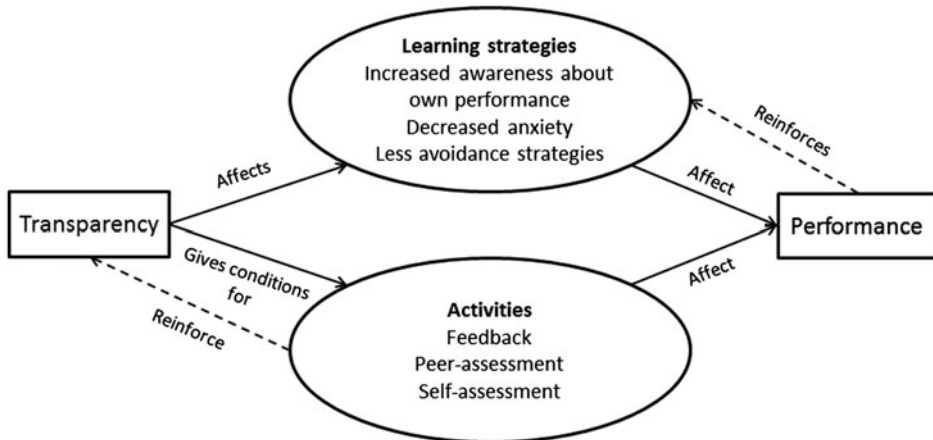


Figure 1. The figure shows a model of the reciprocal relationship between the transparency provided by rubrics and activities where students actively make use of the rubric, such as peer- and self-assessment (adapted from Jonsson 2013b).

does not seem to make much impact on student learning. Still, efforts to increase transparency are almost universally appreciated by students, and there are a number of studies reporting on greatly improved student performance as a result of clarified expectations. In most of this research, however, the use of rubrics has been combined with other instructional interventions, such as peer- and self-assessment or feedback. Panadero and Jonsson (2013), therefore, call for more research on the confounded effects of using rubrics together with different meta-cognitive activities, particularly which activities are needed in order to positively influence the effects of using rubrics, for instance by reinforcing the effect of transparency.

The current paper explores these issues in relation to professional education by describing, and giving examples of, how to make assessment expectations known and explicit through the use of scoring rubrics. The different ways to communicate expectations have been evaluated by investigating how the rubrics are perceived and used by the students.

## Method

The data used for this paper are part of a larger data-set where university teachers' assessment practices have been investigated. The overall design of the research, both the particular study reported on here and the project as a whole, can be described as three parallel case studies (for a report on the project as a whole, see Jonsson 2012). All cases are examples from professional education, where complex tasks were performed by the students, thereby making assessment tools such as rubrics necessary. The recruitment of participants was made through a course in 'the scholarship of teaching', where university teachers working on the development of authentic assessment were contacted. The selection of participants is therefore not representative, not for teachers in professional education and not for the courses at this university or courses in general. Instead, the purpose was to access a number of

assessment situations which included assessments of some kind of professional skills in authentic settings.

Different programmes were chosen in order to get a wider range of situations. The situations studied are:

- The development of a survey instrument, which was part of a course in statistics and epidemiology (15 ECTS credits (European Credit Transfer and Accumulation System, where 60 credits correspond to one year of full-time study)) in a programme for public health. In total, 13 (international) students participated in this course.
- An inspection of a house, which was part of a course about the functions of buildings (15 ECTS credits) within a programme for real estate brokers. In total, 105 students participated in this course.
- A workshop in communication with patients, which was part of a course in the evaluation of diagnostic procedures and treatments of oral infections (30 ECTS credits) in dental education. In total, 48 students participated in this course.

In all cases, the tasks were given to the students in the second half of the course, close to the end. Several methods of data collection were used in this study: observations, questionnaires, interviews and document analysis. Observations were performed in relation to each of the three cases, by participating and taking field notes when the teachers introduced the complex tasks and the rubric to the students, and when the students performed the task. Interviews were performed with both teachers and groups of students. A number of documents have been collected and analysed, such as task specifications, assessment instruments and data on students' performances.

In all three cases, the students answered an eight-item Likert scale questionnaire, including questions about how they perceived the clarity of the rubrics. The analysis of the questionnaires makes an exception to the otherwise qualitative approach, where medians and median absolute deviations have been estimated from students' answers on the questionnaire.

## **The three cases**

### ***Case 1: Project in statistics and epidemiology***

In the course on statistics and epidemiology, the students were expected to design an epidemiological project by constructing a questionnaire and a 'hypothetical' database (i.e. a database with fictitious data). According to the directions given by the teacher, the project could be imagined as a research project by the students. Following this analogy, the report corresponded to a research paper, but without the results and discussions sections. In addition to the written report, the project was also to be orally defended at a seminar with peers. The assignment was performed individually and the students had about a week and a half to carry out the project.

The scoring rubric for the assignment was divided into three sections: (1) the project as a whole, (2) the questionnaire and (3) the database. Each section was further divided into a number of aspects and for each aspect there were four levels of quality (Table 1). According to the teacher, the rubric encompassed the most important aspects of the assignment, but he suggested that additions might be necessary in

Table 1. Excerpt from the scoring rubric used for assessing the design of epidemiological projects in the course about statistics and epidemiology. The aspects assessed are shown in the left column (i.e. data and variable view) and the descriptors for each level are shown in the columns to the right. This excerpt only displays aspects and levels for the database, but the rubric also encompassed aspects for the project as a whole and for the questionnaire.

Data base	Level			
	I	II	III	IV
Data view	Identification variables included	Identification variables included, variables following the order of the questions in the questionnaire	Identification variables included, variables following the order of the questions in the questionnaire, variable names following a logical structure	Identification variables included, variables following the order of the questions in the questionnaire, variable names following a logical structure, misunderstanding of variables considered
Variable view	Labels well written and values specified	Labels well written, values specified, missing values specification	Labels well written, values specified, type correct, width good, values described, missing values specification	Labels well written, type correct, decimals included where relevant, width good, values described, missing values specification considered

the future. He also suggested that it was important to explicitly assign different weights to the criteria, so that more important criteria were given greater prominence during grading.

The project was introduced orally to the students in the whole class, supported by a digital presentation. During the introduction, the teacher presented the expected learning outcomes, expectations in relation to grading, the rubric and what kind of pedagogical support the students could expect to receive when performing the assignment. The criteria in the rubric were presented one by one, each criterion accompanied by a thorough description. The teacher also gave a detailed introduction to the assignment, after which the students could ask questions. This introduction took approximately 45 min. After the introduction, the expected learning outcomes, the assignment and the scoring rubric were made available to the students through a digital learning platform.

### ***Case 2: House inspection for real estate broker students***

In the course about the functions of buildings, groups of students were expected to perform a house inspection, which means that the students systematically review a house (the same building was used for all students) according to the building materials used, heating, protection against dampness, etc. During the inspection, the students had access to blue prints and they could also ask questions to the owner. The inspection was compiled into an inspection report (or ‘real-estate property description’), describing the building for prospective customers, which was handed in digi-

tally through a specific web-based form. The students had a couple of hours to perform the inspection and then three weeks (including Christmas holidays) to compile the report. Besides providing information about the construction of outer walls, windows and heating, which may be categorised as either right or wrong, the students were also asked to reason about consequences relating to choices of different construction or materials.

The scoring rubric for the assignment contained all the aspects supposed to be included in the real-estate property description and for each aspect there were two levels. The first level concerned facts about the building in question, while the second level concerned more general reasoning – but still in relation the building in question (Table 2).

Table 2. Excerpt from the scoring rubric used for assessing students’ reviews of a house in the course about the function of buildings. The aspects to be assessed are shown in the left column (e.g. Laws, loads and constructions) and the students were expected to provide both facts and reasoning about the building in the columns to the right. In addition to the framework shown in this table, the teacher had access to a rubric containing facts and examples in relation to each of the aspects. These facts and examples are, however, not shown for reasons of secrecy.

Aspect	Facts about the building in question		Reasoning about consequences, etc.	
	Comments	<i>p</i>	Comments	<i>p</i>
Laws, real-estate, building		1		–
		1		1
Loads, frames		1		–
		1		1
Constructions		1		1

The house inspection assignment was introduced orally to the students in the whole class, supported by a digital presentation. The teacher presented the scoring rubric in relation to the expected learning outcomes, where he gave several examples of differences between performances of different quality (many in the form of analogies, such as inspections of old cars). He also showed authentic examples of reasoning, relating to the second level in the rubric. Furthermore, the teacher gave examples of how to assess student performance and of professionally designed property descriptions. The introduction took approximately one hour, and afterwards the expected learning outcomes, the assignment and the scoring rubric were made available to the students through a digital learning platform.

**Case 3: Communicating with patients in dental education**

The workshops with dental students were performed with 6–10 students at a time, and each session lasted for approximately three hours. In the beginning of the workshops, the students watched a short movie sequence, showing a dentist who had just finished a clinical examination of a new patient. When the movie ended, the students were expected to take the part as dentists in a role play and communicate with the patient, who was also present in the classroom. While one student was performing, the other students watched and evaluated the performance in relation to

criteria for professional communication. The performance was discussed in the group and the student who had performed received feedback from her/his peers. Then, another student would get the opportunity to act.

The criteria that the students used included different aspects of professional communication, such as explaining clearly to the patient, involving the patient in the communication, trying to reach a mutual agreement about how to perform the treatment, etc. For each aspect, there was also a number of examples of how the aspects could be operationalised, for instance that the student should explain without using medical or technical jargon or evaluate the patient's understanding with both open and closed questions. There were, however, no explicit levels of quality, making the criteria more of a list than a matrix. Furthermore, there were no scores or grades allotted to the criteria (Table 3).

Table 3. Excerpt from the scoring rubric used for assessing students' communication with a patient. The aspect to be assessed is shown at the top (i.e. in this case 'Eliciting information from patient'), together with explanatory examples. At the bottom, there are a number of indicators of successful performance.

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### 3.2. Eliciting information from patient

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For example pose questions in order to evaluate whether the patient has understood the information, listen to and confirm the patient, finding out if the patient has any specific wishes

The student ...

- ... assesses the patient's understanding of problem by using both open and closed questions as appropriate
  - ... demonstrates effective listening in a way that the patient feels heard and understood (i.e. uses non-verbal cues such as nodding, pausing, maintaining eye contact and verbal skills including back-tracking, reflecting, mirroring)
  - ... takes the patient's perspective into consideration, including the patient's individual concerns, beliefs, and expectations
  - ... respects the patient's cultural and ethnic beliefs, practices and language
  - ... tackles personal questions sensitively
  - ... asks if patient has any questions
- 

The assignment was introduced to the students orally at the beginning of each workshop, which means that the students had no time for preparation. At the same time, the students also received the assessment criteria, but without any in-depth introduction. Instead, the students were supposed to make use of the criteria when discussing and evaluating each other's performance during the role-play situations (i.e. using the criteria for peer-assessment and peer feedback).

## Findings

As can be seen from the descriptions of the three cases, although explicit criteria were used in each, the ways in which the teachers chose to introduce the criteria to the students varied. In one of the cases (statistics and epidemiology), the teacher introduced the rubric by explaining the aspects to be assessed one by one to the students. In another case (real estate brokers), the teacher used a more holistic approach by trying to convey underlying qualities permeating all of the aspects. This teacher also showed samples of student work, exemplifying the different standards in the



rubric. In the third case (dental education), the students were given a brief explanation of the criteria and were then asked to use the rubric to assess the performance of peers. In two of the cases, therefore, the rubrics were not only handed out to the students, but thoroughly explained by the teachers. Furthermore, the criteria were not given only orally, but were – in all cases – made available to the students in writing. This enabled the students to go through the criteria in detail before doing the assignment, as well as returning to the rubrics on several occasions (i.e. the rubrics were made accessible, both in terms of understanding and availability).

Another important aspect is that, even if the rubrics were not entirely task specific (i.e. they could be used for assessing other similar tasks), the criteria were still closely aligned with the assignments. This means that the students had the opportunity to use the criteria while performing, for instance in order to guide or scaffold task performance or to self-assess and regulate their progress. As has been shown in relation to feedback, the opportunity to actually make use of feedback is intimately connected to a sense of meaningfulness among the students (Jonsson 2013a). The results from this study also show that a number of students took the opportunity to use the criteria for assessing and regulating their work, even if they were not encouraged to do so. Importantly, as suggested in Figure 1, the use of rubrics for self-assessment or peer-assessment purposes may positively influence student understanding of the criteria, which in turn reinforces student self-assessment or peer-assessment practices. That many students chose to actively use the rubrics to guide their performance may, therefore, have had an influence on their perception and understanding of the criteria.

Taken together, in these particular contexts the teachers facilitated the communication of expectations to the students by:

- making the rubrics accessible through explanations, timing and obtainability and
- aligning the criteria with the assignments, thereby inviting the students to use the rubrics as guides to performance, as well as tools for self-assessment and reflection.

### *Students' perceptions of the rubrics*

Despite the variation in the ways of introducing and explaining the rubrics to the students, as well as the variation in rubric design, the results from the student questionnaire show that the students in all cases perceived the criteria as both comprehensible and useful. As can be seen in Table 4, there was a median of 4 on the five-point Likert scale in all cases, with quite limited dispersion around the median.

Some typical student comments about the criteria are given below. All the quotes are from dental education, and students' answers on the specific item in the questionnaire are given in parenthesis. As can be seen from these quotes, most students appreciated the support given by the criteria. Those students who did not, either thought the criteria gave too much support or that the criteria did not add anything to his/her current understanding.



Table 4. Results from the student questionnaire on items asking about perceived transparency and usefulness of criteria.

	Case		
	Statistics and epidemiology ( $n = 7$ )	Functions of buildings ( $n = 47$ )	Diagnostic procedures ( $n = 39$ )
Perceived transparency	4(0)	4(0)	4(1)
Perceived usefulness	4(1)	4(1)	4(1)

Note: In the questionnaire, a Likert scale ranging from 1 (lowest) to 5 (highest) was used. Values presented are medians and median absolute deviations (in parentheses). The three cases have been compared with the Kruskal–Wallis test, but no statistical significant difference was established. Except for the case Diagnostic procedures, the response rate was approximately 50% (54, 45 and 81% respectively).

The criteria worked as ‘reminders’ and gave you the opportunity to reflect about the aspects [of your performance] that you missed. (5)

The criteria reminded you about what is important in a conversation [with patients]. They were more like useful hints to facilitate the conversation than actual requirements. (4)

It’s valuable to know what to look for and to think about. (3)

The criteria almost gave too much support. I would rather have figured it out myself. (2)

### *Students’ use of the rubrics*

Another indication of successful communication of expectations is students’ actual use of the criteria. For instance, the real estate broker students were interviewed during their house inspection, and they could easily describe the meaning of the criteria, and often made references to the teacher’s explanations and the analogies made during the introduction of the assignment. That the majority of these students actually performed very well on the task (73% received ‘pass with distinction’) also lend support to their understanding of the criteria. Similarly, the dental students could effectively use the criteria to discuss each other’s performances and give each other feedback, indicating that they indeed had an understanding of the criteria. It is obvious in both of these cases that a majority of the students were able to use the criteria to support their task performance.

According to open-ended responses in the questionnaire, students have used the criteria in a number of different ways. In particular, several students claim that they have used the rubrics in order to structure and assess the progress of their work. However, some students also claimed that they did not use the criteria, either because they did not have to or because they did not want to. Some typical student comments about the criteria are given below, where the two top quotes are from students who have used the criteria and the two bottom ones are from students who did not use the criteria. All quotes are from real estate broker students.

I used the rubric as guidance when planning the assignment.

We used the criteria as targets to make sure we included all the important aspects in the assignment.

[I did not use the rubric] because [the teacher] made everything so clear during the introduction.

[I did not use the rubric because] I wanted to manage without any clues.

Another way of using the rubric, which was particularly prevalent among the dental students, was as a basis for reflection about their own competency (i.e. using the rubric to reflect about their performance as professionals beyond the scope of the assignment).

## Discussion

This paper aimed to describe, and give examples of, how to make assessment expectations known and explicit to students through the use of scoring rubrics. As indicated by the findings, the students in all cases perceived the criteria as both comprehensible and useful, despite the variation in the ways used to introduce and explain the rubrics to them, as well as differences in rubric design. This is seen in the student questionnaire, but also in interviews with students and in how the students actually used the criteria when performing. Furthermore, the students used the rubrics in order to structure and assess the progress of their work, as well as a basis for reflection about their own competency. The factors identified, which are suggested to facilitate the communication of expectations to the students, are: (1) that the rubrics were made accessible through explanations, timing and obtainability and (2) that the criteria were aligned with the assignments, thereby inviting the students to use the rubrics as guides to performance, as well as tools for self-assessment and reflection.

### *Accessibility*

As noted, the teachers made the rubrics accessible to the students, both in terms of understanding and availability. First, the teachers explained the meaning of the criteria in the rubric, which was done aspect by aspect, holistically or by letting the students use the criteria during an instructional event. The breadth of different approaches used by the teachers suggests that it is not how this is done that is of importance, but that it is done. The effects on student learning in conditions where students receive a rubric but not any (or only minimal) training in using it are typically none, small or only partial. However, this also depends on the educational level at which the studies are performed, as students seem to become less dependent on training and explanations as they proceed through the educational system (Jonsson and Svingby 2007; Panadero and Jonsson 2013).

Second, the teachers in the cases studied presented the rubrics to the students *before* they carried out their assignments. This means that the students could use the rubrics as guides when planning, executing and assessing their performance – and not only for summative evaluation. This coincides with what students claim that rubrics may help them with, such as focusing their efforts and producing work of higher quality, but also feeling less anxious about assignments (Reddy and Andrade 2010).

Third, the teachers made the rubrics available to the students by publishing the documents digitally or by handing them out on paper. The students did not, therefore,

have to rely on teachers' oral description and their own interpretations and notes. Instead, the criteria could be reviewed and discussed both individually and among peers. The students could also have the rubrics beside them when they performed their assignments or, in the case of the dental students, assessed their peers.

### *Alignment*

It may seem obvious that a rubric should be aligned with the task, but even if considered 'aligned' a rubric can still be designed in several different ways, such as being either analytical or holistic. According to Panadero and Jonsson (2013), there seems to be a lack of research systematically investigating the impact of different rubric design. Still, it seems reasonable to assume that analytic rubrics, which explicitly spell out the aspects to be assessed, should be more useful for formative assessment. In a similar vein, it seems plausible that a rubric's position on a continuum from highly task specific to generic may affect how useful the rubric is for students to guide and assess their performance.

As an example, Balan (2012) used a generic rubric for mathematical problem-solving in upper-secondary school, which strongly affected students' learning in a positive direction, but it took the students several weeks to comprehend and use the rubric for self-assessment and peer assessment purposes. Learning to use this rubric was therefore an investment, which paid off since the students were able to use the rubric during the remaining part of the course whenever they encountered a mathematical problem-solving situation. In the cases described in this study, however, it is doubtful whether such generic rubrics would have provided enough guidance to the students, since they were supposed to use the rubrics with basically no training. Instead of assessing abstract skills, such as 'making mathematical interpretations' or 'showing confidence with regards to calculations and solutions', as in Balan (2012), the aspects expressed by the rubrics in this study were comparably concrete and had a strong connection to the tasks. Furthermore, the criteria assessed were all *direct*, in the sense that they could be assessed without having to transform the scores to (indirect and unobservable) theoretical constructs, such as 'competency' or 'ability'.

As argued by Frederiksen and Collins (1989), in their seminal article about valid testing, direct assessment (i.e. assessments that 'attempt to evaluate a cognitive skill as it is expressed in the performance of extended tasks', 29) has many advantages, not least that instruction which improves student performance on a direct task will at the same time improve the very skill sought to assess. In indirect assessments, on the other hand, the connection between the skill sought for and what is actually assessed may not be clear to the students, due to the sometimes complex transformation of scores to interpretations of student performance. Such assessments may even be misleading by emphasising low-level skills and memorisation of factual knowledge, which are aspects of performance that may very well correlate with the high-level skills sought to assess, but do not constitute these skills and do not easily lead to improvements of student performance of the high-level skills. In this case, the directness of the criteria is seen to facilitate student engagement with the rubrics; to guide their performance and as tools for self-assessment and reflection.

Although the rubrics in this study were direct and had a strong connection to the tasks, they were not, however, entirely task-specific. The rubrics could still be used for similar tasks, such as other communicative situations with patients, other house inspections or other projects. This means that although students may have fewer

problems interpreting and applying criteria in the case of task-specific rubrics, these rubrics may still have a value in supporting student progression across tasks (see e.g. Wiliam 2007).

## Conclusions

The current paper has given examples of how to make assessment expectations known and explicit through the use of scoring rubrics. As suggested by the results, students found the rubrics both comprehensible and useful, and they made active use of the criteria when performing. Findings also indicate that making rubrics accessible through explanations, timing and obtainability, as well as aligning the criteria closely with the assignments, may facilitate students' understanding and use of the rubrics.

It should be kept in mind that these findings come from a small-scale study of three particular cases in professional education and as such they do not necessarily generalise to other settings. In particular, the validity and generalisability of accessibility and alignment of rubrics, including the use of direct criteria, as key concepts for the communication of expectations need to be further investigated in other contexts.

## Notes on contributor

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