

Sport and exercise sciences students' and teaching assistants' perceptions of rubrics in tertiary education

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Abstract

Little is known about the use that sport and exercise sciences students of different levels of study at university make of grading rubrics. The aims of this study were to develop a greater understanding of the perceptions students and teaching assistants (TAs) have of grading rubrics when writing and grading laboratory reports, respectively. Results showed that students in the earlier stage of their academic careers had more positive perceptions of rubrics and that students in the later part of their academic careers wanted more specific information from rubrics. Despite having positive perceptions of the rubric, nearly a third of teaching assistants chose not to use the rubric to inform their grading. Grading rubrics were generally well received by students at each level of study and benefits of rubrics included planning and enabling students to understand what to include in a report. Grading rubrics should be presented to sport and exercise students to enhance the educational scaffolding within the learning environment.

Keywords: sport and exercise sciences; grading rubrics; pedagogy.

Introduction

Hopeful tertiary sport and exercise sciences educators aim for their students to develop a scientific attitude (Dewey, 1934) and scientific literacy (Anelli, 2011). To achieve these aims, educators at the author's institution ask students to complete small laboratory-based experiments that include some form of sporting activity or exercise. After these real-life experiments, in which students are taught valid and reliable methods of collecting data, these students encounter a challenge – report writing. Often, laboratory report writing is a

daunting task that students have little experience in. As such, tertiary educators should carefully consider how to best support students in the 'post-experiment' activity of report writing. Tertiary educators can support students in developing a scientific attitude, improve scientific literacy and gain confidence in science writing by offering scaffolding within the educational environment (Lin et al., 2012).

One scaffolding tool that educators can use is a grading rubric (Reddy and Andrade, 2010). Rubrics are tables that provide qualitative descriptions of what a student needs to do to achieve a given standard of work (Reddy and Andrade, 2010) and are used in a variety of settings, including sport sciences, physics, psychology, physical therapy and nursing (Kocakulah, 2010; Reynolds-Keefer, 2010; Shipman et al., 2012; Bradley et al., 2020; García-Ros et al., 2021). When used as part of a student-centred education process, a well-designed rubric is an important part of the learning experience (Reddy and Andrade, 2010; Fraile et al., 2017). Indeed, when viewed through a constructivist lens (Biggs, 1996), rubrics can assist students to construct knowledge, develop understanding, enhance meaning and provide clearer goals (Andrade, 2000; Reddy and Andrade, 2010; Jönsson and Panadero, 2016; Fraile et al., 2017) .

Rubrics as scaffolds for students and instructors

Research into the use of rubrics in tertiary education is growing, and evidence for the use of rubrics appears to be mainly positive, but some significant criticisms do exist (Panadero and Jönsson, 2020). Benefits of rubrics include transparency of assessment criteria (Jönsson, 2014), improved academic performance (e.g., Kocakulah, 2010), enabling planning for assignments (Andrade and Du, 2005) and, importantly, reducing anxiety with regards to assignments (Andrade and Du, 2005; Reddy and Andrade, 2010; Jönsson and Panadero, 2016). In contrast, increased student anxiety, reduced autonomy, and students 'checking boxes' to complete assignments are examples of drawbacks of rubrics that have been identified (Reynolds-Keefer, 2010, Panadero and Jönsson, 2020).

Rubrics offer students the opportunity to understand what is required in specific sections of a report (i.e., enhance assignment transparency) and the differences between levels of

performance before they begin writing their report (Reddy and Andrade, 2010; Jönsson, 2014). Previous research has shown that assignment transparency has a positive relationship with student academic performance (Kocakulah, 2010; Jönsson, 2014), but enthusiasm for the use of rubrics extends beyond student performance. Rubrics also offer students the opportunity to develop self-regulation skills, including planning and self-assessment (Andrade and Du, 2005; Reynolds-Keefer, 2010; Panadero and Jönsson, 2013; Greenberg, 2015). Finally, several studies have reported that rubrics can help to alleviate some of the anxiety students feel when completing reports via increased communication between students and the instructor (Andrade and Du, 2005; Reynolds-Keefer, 2010; Jönsson and Panadero, 2016).

But rubrics are not the panacea for all assignment related troubles students may face. Reynolds-Keefer (2010) reported that some students mentioned that the rubric increased anxiety about assignments because they found the generic nature of the rubrics were not helpful and that there was added pressure due to the specificity of the requirements for high quality work. The issue of specificity in rubrics was also addressed by Panadero and Jönsson (2020) who commented that if rubrics had explicit criteria, there was an increased risk of students 'checking boxes' when completing reports. This sort of criteria compliance can lead to students not gaining the skills universities often hope their students will develop, including self-sufficiency, critical thinking and independent thought (Lehmann, 1963, Pascarella et al., 1996, Huber and Kuncel, 2016). Finally, Li and Lindsey (2015) mention that some students had difficulties understanding key words in rubrics, thus reducing the effectiveness of the rubric as an educational tool.

Teaching assistants (TAs) also benefit from having a rubric to use when grading reports. Research has shown graders can experience a reduction in marking time, improved reliability and accuracy in marking, and improved consistency in marking (Jönsson and Panadero, 2016, Bradley et al., 2020, Reddy and Andrade, 2010). All these outcomes of rubric use can be seen as a positive, but Reddy and Andrade (2010) report that there may be some negatives for instructors associated with rubric use, including instructor perceptions that rubrics require time and effort to use.

Differences in students' perceptions of rubrics

Despite a growing body of research into the use of rubrics in tertiary education, there remain questions about how students at different levels of study perceive and use rubrics. Undergraduate students at each level of study face different academic challenges – while first-year students are focused on developing initial knowledge in new content areas (Wingate, 2007; Quinn and Aarão, 2020; Burns et al., 2022), final year students are often faced with deeper academic challenges, including the ability to critically examine different viewpoints, perform reliable analyses, and apply knowledge in flexible and adaptive ways to a variety of contexts (e.g., see Kumta et al., 2003),

While studies by Bolton (2006), Powell (2002) and Chan and Ho (2019) have gathered data from management, film and TV production, and nursing students at different levels of study, respectively, to the knowledge of the author, only one study has made a comparison of student perceptions between different levels of study (Leader and Clinton, 2018). Results from Leader and Clinton (2018) showed a lower percentage of postgraduate students used rubrics when available to inform their work. One issue that has not been addressed adequately in the literature is the perception sport and exercise sciences students at different stages of their university career have of rubrics.

This study: context and aims

This study was conducted in a university department that teaches sport and exercise sciences to undergraduate and postgraduate students. The 200- and 300-level students (typically, second and final year, respectively) and TAs who volunteered to participate in this research had not previously been presented with rubrics to accompany their laboratory assignment details. It was not known if the 100-level (i.e., first year students) had experience with laboratory report writing or grading rubrics before; they were, however, provided with an example template for a laboratory report to aid them in their writing.

The aims of this research were to build upon the work of Bradley et al. (2020) to develop a greater understanding of 1) the value undergraduate sport and exercise sciences students

and laboratory TAs assign to rubrics, 2) the perceptions students and TAs have of rubrics, and 3) the different ways students and TAs use rubrics when writing or grading laboratory reports, respectively. The objectives of this research were to evaluate responses to a questionnaire about rubrics from first-, second- and third-year undergraduate students and TAs and to identify common themes in comments made about the use of rubrics when writing or grading reports. Given that students at earlier stages of their university career have less experience in writing science reports, it was predicted that students at different stages of their university careers would differ in their perceptions and use of rubrics. It was also predicted that TAs would have positive perceptions of rubrics.

Methods

To understand more about the perceptions students have of rubrics, this study employed a descriptive, cross-sectional mixed methods approach. Quantitative differences between year groups of students were obtained via responses from a Likert-scale questionnaire, and qualitative information about student experiences was gathered through free text comments.

Participants

139 undergraduate sport and exercise sciences students at the 100- (n = 34), 200- (n = 77) and 300-level (n = 28), and 16 TAs (age range of all participants, 18-44) at the host university anonymously and voluntarily participated in the study. The papers taken by students were in the areas of biomechanics, exercise physiology and/or motor behaviour. TAs that participated in this study were employed on casual contracts to teach in the laboratory in either one or both semesters in 2021.

Questionnaire

Bradley et al. (2020) completed a similar study, and the same questionnaire employed by

them was presented to students in this study (see Appendix). Questions in the questionnaire designed by Bradley et al. (2020) asked students about their perceptions and use of the rubrics provided to them. TAs were provided with a slightly modified version of the Bradley et al. (2020) student questionnaire to suit the different nature of their use of grading rubrics. The student and demonstrator questionnaires comprised 11 and 10 questions, respectively (see Appendix). Questions in both the student and demonstrator questionnaires were scored on a 1–6 Likert scale (1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree). Students and TAs were also given the option to provide free text comments. Guidance on what types of comments could be provided was provided (see Appendix). All participants' answers to the questions and free text comments were collected and stored using REDCap (Research Electronic Data Capture, Version 11.0.3) data collection tools. SPSS (Version 27) was used for quantitative data analysis.

Procedure

Before it commenced, the study was approved by the host university's ethics committee. After consulting existing literature, and considering the requirements for each assignment, grading rubrics were designed and inserted into all respective assignment information documents. TAs were not involved in the design of the rubrics. The assignment information documents were provided to students and TAs at least five days before a laboratory session was conducted. Following all laboratories, and at the conclusion of the semester, an invitation to participate was sent out to 669 sport and exercise sciences students and 18 TAs via email.

Data analysis

For each question in the questionnaire, the average, median and variability (i.e., standard deviation) were calculated for the two main groups (i.e., students and TAs) and for each sub-group of students (i.e., 100-, 200-, 300-level). Average responses for each question answered by students at each level of study and TAs are presented in Table 1 and Table 3, respectively. Then, the average and standard deviation of all questions were found for each sub-group of students. For the purposes of this paper, responses of 4 (i.e., slightly

agree) or higher are described as positive responses, and responses of 3 (i.e., slightly disagree) or lower will be described as negative responses. The percentage of all students and percentage of students in each year group who had positive perceptions were calculated and are presented in Figure 1.

To determine whether the different sub-groups of students had more or less positive perceptions of the rubrics, an ANOVA was performed, followed by one-tailed independent sample t-tests with a Tukey's LSD correction to account for multiple comparisons being made. To establish the magnitude of the difference between year groups, Cohen's d was calculated. Effect size descriptors were small ($d = 0.2$), medium ($d = 0.5$), and large ($d = 0.8$) (Lakens, 2013). The internal consistency of the questions in each questionnaire was tested by calculating Cronbach's Alpha. Students' questionnaire $\alpha = 0.914$ and TAs' questionnaire $\alpha = 0.910$ indicated excellent internal consistency.

Each free text comment was read and categorised as a positive, negative or combined comment. Combined comments were those that had elements of positive and negative perceptions. The percentage of positive, negative and combined comments for each sub-group of students and TAs are presented in Table 2. Finally, all comments were examined to extract common themes.

Results

Student responses

Students' perceptions questionnaire

Across all students, the average score across all questions was 4.67 (SD = 0.82), indicating that students slightly agreed with the statements in the questionnaire. However, the variability between all students was relatively high (coefficient of variation = 0.18). For the majority of the questions in the questionnaire, at least 84% of all students indicated that they had positive perceptions of rubrics (see Table 1 and Figure 1). However, only 53% of students were prompted into beginning their assignments earlier and 61% felt that the rubrics helped them to know what grade they would receive for the report.

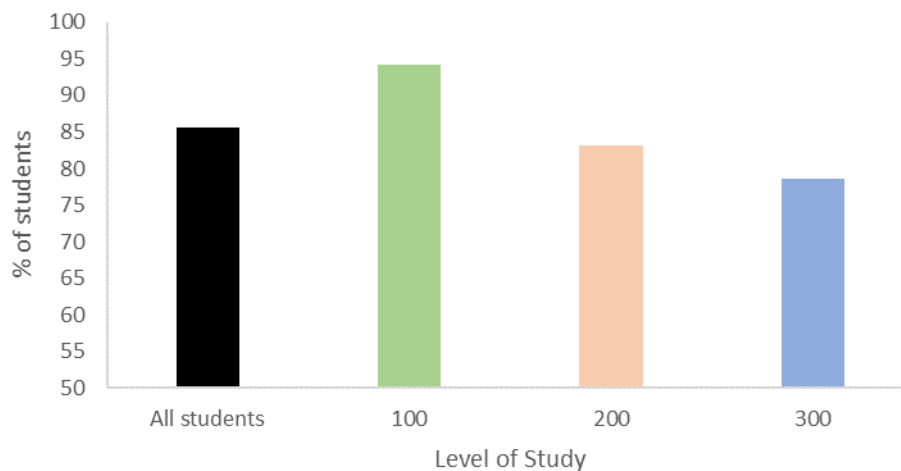
Table 1. Average and standard deviation of student's answers to questions about perceptions of rubrics and results of ANOVA comparing between year groups.

| | Level of Study | | | | ANOVA | |
|--|----------------|------|------|------|-------|--------------|
| | | 100 | 200 | 300 | F | <i>p</i> |
| The rubric uses language that is easy to understand | \bar{x} | 5.21 | 4.82 | 5.04 | 2.2 | 0.110 |
| | SD | 0.48 | 1.11 | 0.69 | | |
| The rubric clearly defined the criteria required for each level | \bar{x} | 5.21 | 4.75 | 4.78 | 2.9 | 0.060 |
| | SD | 0.77 | 1.03 | 0.89 | | |
| The rubric helped me understand what was wanted on this assignment | \bar{x} | 5.15 | 4.88 | 4.96 | 0.6 | 0.553 |
| | SD | 0.82 | 1.12 | 1.04 | | |
| I used the rubric while completing the assignment | \bar{x} | 5.29 | 5.26 | 5.07 | 0.4 | 0.696 |
| | SD | 0.94 | 1.13 | 1.21 | | |
| Did the process make you start your report earlier? | \bar{x} | 3.94 | 3.56 | 3.18 | 2.8 | 0.064 |
| | SD | 1.32 | 1.38 | 1.19 | | |
| The rubric is a fair way to assess assignments | \bar{x} | 5.26 | 4.91 | 4.68 | 3.0 | 0.053 |
| | SD | 0.62 | 1.04 | 1.06 | | |
| The feedback provided on the rubric was useful | \bar{x} | 4.94 | 4.73 | 4.29 | 3.1 | 0.047 |
| | SD | 0.70 | 1.06 | 1.33 | | |
| The rubric helped me know what I was doing well | \bar{x} | 4.76 | 4.63 | 4.44 | 0.6 | 0.558 |
| | SD | 1.05 | 1.25 | 1.15 | | |
| The rubric helped me know what I needed to work on | \bar{x} | 4.82 | 4.53 | 4.52 | 0.8 | 0.445 |
| | SD | 0.80 | 1.35 | 1.19 | | |
| I know what grade I will receive for the report | \bar{x} | 3.76 | 3.45 | 3.75 | 1.1 | 0.326 |
| | SD | 0.99 | 1.42 | 1.14 | | |
| The rubric helped me to write a better report | \bar{x} | 5.03 | 4.73 | 4.63 | 1.3 | 0.272 |
| | SD | 0.81 | 1.20 | 0.84 | | |

Comparisons between students of different year groups revealed students in the early

stages (i.e., 100-level) of their academic careers tended to have more positive perceptions of rubrics compared to their older peers. Average scores across all questions in the questionnaire for 100-, 200- and 300-level students were 4.91 ($SD = 0.57$), 4.60 ($SD = 0.91$) and 4.57 ($SD = 0.79$), respectively. Additionally, between 100- and 300-level, a reduction was seen in the percentage of students in each year group who had positive perceptions of rubrics (see Figure 1).

Figure 1. Percentage of students with positive perceptions of rubrics.



ANOVA revealed that across year groups students differed in their perceptions of the usefulness of the feedback rubrics provided (see Table 1). Post hoc tests revealed that 300-level students were less positive than 100-level students, $t(38.9) = 2.36$, $p = .012$, $d = 0.64$, and 200-level students, $t(103) = 1.76$, $p = .041$, $d = 0.39$, about rubric feedback being useful (see Table 1).

Students' free text comments

Free text comments were provided by 53, 36 and 46% of 100, 200 and 300-level students, respectively. More negative comments were made by 300-level students than the other two student groups (see Table 2).

Table 2. Percentage of positive, negative and combined free text comments made by students and TAs.

| | 100 | 200 | 300 | TAs |
|-----------------|------|------|------|------|
| Positive | 55.6 | 50.0 | 27.3 | 11.1 |
| Negative | 0.0 | 5.3 | 45.5 | 11.1 |
| Combined | 44.4 | 44.7 | 27.3 | 66.7 |

Free text comments indicated that students felt rubrics provided clear criteria, assisted with understanding requirements, helped them to know what to do to perform well and were useful for feedback, for example: 'I thought they were very helpful to show what was required in an assessment, particularly if the original instructions were a bit more complicated and hard to understand' (100-level student). Comments from two 200-level students highlighted the rubrics' usefulness for learning and feedback: 'The rubrics helped me to understand exactly what detail and information was required for each part of my report. It allowed me to be concise in my writing but still having enough detail for a good grade', and 'The comments [in the rubrics] played a key role in my learning and helped me re-evaluate my previous reports'.

Students at each level of study commented positively that the rubrics assisted with planning for assignments: 'I think they were exceptional and should be continued. I could gauge the criteria and plan my lab reports accordingly' (200-level student). Another student said that the rubrics 'acted like a checklist of what one [report] needed to contain' (300-level student). Finally, a 100-level student said that the rubrics 'were a useful tool which give students the opportunity to tick the boxes of whatever grade they are aiming for'. However, not all students had a positive perception of the rubrics, one 200-level student in particular found them 'Very uninformative, not detailed, and overall confusing', and a 300-level student mentioned that 'they aren't very clear on the specifics of the details they want'.

Some students provided thoughtful feedback about rubrics; for example, one 200-level student said: 'Some of the language used in the rubric was hard to understand & therefore it was hard to understand what was asked of me', and a 100-level student mentioned: 'I

liked that they were expressive in what the report should include, but it's too broad to understand what might be missing'. Finally, some students thought that, while they were useful, the rubrics were a little generic. Two 300-level students commented that 'More specificity to a single report would be good, [rubrics] tended to be quite generic across the paper', and 'they aren't very clear on the specifics of the details they want'. This sentiment was also echoed by a 200-level student who said they felt that 'Some of the rubrics were unclear'.

Teaching assistants' responses

TAs' perceptions questionnaire

Across all questions, TAs had positive perceptions of the rubrics ($M = 4.8$, $SD = 0.74$) and had similar within sub-group variability (coefficient of variation = 0.15) compared to students. 78% (11/14) of TAs indicated that they had an overall positive perception of the rubrics.

Somewhat surprisingly, 27.5% of TAs disagreed that they used the rubrics to inform their grading. The TAs who did use the rubrics had positive perceptions of them and agreed or strongly agreed that rubrics helped them to understand what was required in reports, what feedback could be given to students, and that the rubrics helped them to be better graders.

Teaching assistants' free text comments

64% of TAs provided written comments about the rubrics. Overall, TAs were more critical of the rubrics compared to the students. One TA was generally positive about the rubrics, two expressed a negative opinion of the rubrics, and six provided combined comments. Three comments in particular captured the general views expressed by TAs: 'I think the rubrics are okay and helped more for when I was on the fence about whether to give someone a higher or lower mark. However, I believe these rubrics can be a little too vague'. Further, and echoing the sentiment expressed in a student comment, one TA said: 'Rubrics that are specific to each report would also be helpful - e.g., if certain key terms are required for marks, these could be stated in the rubric'. Finally, one insightful comment captured the difficulty of creating rubrics and the versatility they can lack:

I think the rubrics are a really good base. But there is often a big gap between say a 2 and a 3 [out of a possible 4 marks] where half and quarter marks are taken off which aren't reflected in the rubric. Although would be impossible to have a rubric for every scenario I think there could be more detail in some of them.

Table 3. Average (\bar{x}) and standard deviation (SD) of TAs' answers to questions about perceptions of rubrics.

| | | |
|---|-----------|------|
| | \bar{x} | 5.21 |
| The rubric uses language that is easy to understand | SD | 0.43 |
| | \bar{x} | 4.79 |
| The rubric clearly defined the criteria required for each level | SD | 0.80 |
| | \bar{x} | 5.14 |
| The rubric helped me understand what was wanted on this assignment | SD | 0.66 |
| | \bar{x} | 4.29 |
| I used the rubric while grading the assignment | SD | 1.27 |
| | \bar{x} | 4.50 |
| Did the rubric make your task of grading easier? | SD | 1.09 |
| | \bar{x} | 5.00 |
| The rubric is a fair way to assess assignments | SD | 0.96 |
| | \bar{x} | 4.64 |
| The feedback provided on the rubric was useful | SD | 1.08 |
| | \bar{x} | 4.79 |
| The rubric helped me know how I should grade an assignment | SD | 0.89 |
| | \bar{x} | 4.46 |
| The rubric helped me know what feedback I could provide | SD | 1.39 |
| | \bar{x} | 4.86 |
| The rubric helped me to be a better grader | SD | 1.03 |
| | \bar{x} | 4.77 |
| Whole questionnaire average | SD | 0.74 |

Discussion

This research aimed to investigate the perceptions sport and exercise sciences students and TAs have of grading rubrics. It was predicted that students at different levels of study would differ in their perceptions and use of rubrics. Interestingly, trends within the data indicate that the 100- and 200-level students had more positive perceptions of the rubrics and found them more useful compared to the 300-level students.

Clarity, transparency and planning

Rubrics enable students to have a clear idea of what is required when writing a report and act as a tool for planning assignments (Andrade and Du, 2005; Jönsson, 2014). 94% of students in this study provided positive responses to the questions about assignment requirements, and these findings mirrored those of Bradley et al. (2020). But, while some students generally found the rubrics aided transparency, others did not perceive the same benefit. 100-level students tended to be more positive than other year groups (see Table 1).

The questionnaire utilised in this study did not specifically ask students about planning for assignments; however, two key themes related to planning emerged from free text comments revealing nuanced perspectives of rubrics. First, students at all levels of study commented that the rubrics were like a check list enabling them to plan accordingly. In this case, the rubrics acted like a plan for the students to follow. Second, older students mentioned that rubrics needed to be more specific and include more detail and this issue was also reported by Reynolds-Keefer (2010). However, the need for more direction when creating their reports is seemingly counterintuitive if it can be assumed that with increased university experience comes an increased ability to think critically and be independent (Lehmann, 1963; Pascarella et al., 1996, Huber and Kuncel, 2016).

Taken together, these themes indicate that by providing rubrics to students the lines between scaffolding and spoon-feeding are being blurred. Certainly, scaffolding the student's learning environment with advice (like rubrics) in assignment information documents is important. However, too much direction (i.e., spoon feeding) may reduce the

independent thought students need to use when writing reports (Balloo et al., 2018). The present results provide further evidence for the arguments of Sadler (2007) and Balloo et al. (2018) who discuss that providing explicit guidance may result in a transactional approach to assessment whereby students are dependent on highly detailed assessment guidance, attempt to 'check the boxes' when completing assignments and take little ownership of the learning process.

Improved academic performance

Another benefit of rubrics discussed in the literature is that they can aid academic performance (Kocakulah, 2010). On average approximately 85% of students in the present study were positive about the effect that using the rubrics had on their academic performance. Students commented that the rubrics enabled them to be more concise in their writing, gave enough detail to achieve good grades and had positive effects on their learning. Interestingly, a similar pattern of results was seen in the results presented in the study by Bradley et al. (2020), such that ~83% of their students were positive about the effect that rubrics had on academic performance.

But while improved academic performance is a central concern for educators, Sadler (2007) suggests one risk of elaborate scaffolding is that students almost have no option but to succeed. The present study's results showed that students' perceptions of the influence of rubrics on academic performance were positive but changed with experience in a way that was not predicted. From 100-level to 300-level, reductions were seen in the average scores for questions related to academic performance. One factor that may explain this trend is the significantly lower perceptions 300-level students had about the usefulness of feedback provided by rubrics. If students feel that they are not receiving appropriate feedback, they may feel that their academic performance is hindered. However, there is a dearth of research into the differences in reflective practice between year groups of sport and exercise sciences students and this presents an opportunity for more research.

Teaching assistants' use of rubrics

The results of this study show that there appears to be a disconnect between the perceptions TAs have of rubrics and their use of them to guide marking. Despite responses to the questionnaire revealing that TAs agreed that the rubrics were easy to understand, clearly defined criteria to be met for each score, and assisted them to know how to grade assignments, less than 75% percent of TAs actually used the rubrics to inform their grading. This is concerning because it appears that nearly 30% of TAs are actively avoiding using a useful tool that will help them in their job. Reddy and Andrade (2010) also reported that instructors tended to avoid using rubrics.

The issue of the rubrics being too vague or needing more details was mentioned by 78% of TAs and may explain why TAs chose not to use them. For example, one TA commented that certain key terms should be included in the rubrics. However, this comment re-introduces the issues of scaffolding and 'spoon-feeding' in the educational environment, but this time from the TAs' perspective. However, too much direction for TAs may lead them to feel unduly restricted by the rubric. Additionally, as Sadler (2007) and Balloo et al. (2018) discuss with regards to students, the process of providing explicit guidance may result in a transactional approach to assessment; one risk associated with rubrics is that TAs may also feel the need to effectively 'check the boxes' and bring little creativity to the grading process. However, accurately assessing the quality of the work presented demands an element of creative thought from the grader. This idea was discussed by Marshman et al. (2018), who received a comment from a TA, who said that rubrics did not allow much flexibility when answers provided are complex and have many interwoven elements.

On the contrary, taking a transformative approach to assessment encourages students to take ownership of the learning process with instructors. A transformative approach includes engaging students in discussions about assignment requirements, encouraging students to work with assessment criteria (e.g., such as those described in rubrics) and TAs working with students to explore solutions to problems presented during laboratory-based experiments (Balloo et al., 2018). Since TAs are often high-achieving senior or postgraduate students, it is likely that TAs, while having excellent content-specific knowledge, require additional coaching with regards to teaching (Santhanam and Codner,

2012). That is, it may be the case that TAs need to lead focused discussions with students about what loaded terms (e.g., synthesise, assimilate, appropriate or relevant) mean in rubrics and how they should be interpreted by students. This type of discussion may be out of the comfort zone of TAs (especially new TAs), and extra coaching for TAs may need to be provided with regards to helping students to develop assessment literacy.

Limitations

The first, and probably most important, limitation of this study was that, for the study's older cohorts (including TAs), rubrics had not been provided to them before. It was decided by teaching staff that rubrics would provide additional support structures for students and TAs when they were writing up or grading laboratory experiments, respectively. It was not known whether the 100-level students had completed science reports or been presented with grading rubrics during their secondary school education. It was seen as important to offer younger students some guidance regarding how to structure a report, especially for those who may have never written a formal science report before. The combination of the exemplar and the rubrics may have assisted their interpretation of the rubric's content.

Second, information about sex was not collected in this study; however, some studies have reported significant differences between sexes in the use of rubrics, whereas this was not a factor in other studies (Greenberg, 2015; Panadero and Jönsson, 2013). Finally, there was no option for students to respond to the questionnaire's questions with a neutral response. It may have been the case that if students were presented with a neutral option, given that there was a theme within free text comments that the rubrics were vague, or required more detail, those students who responded with 'slightly agree' or 'slightly disagree' may have chosen to respond neutrally.

Conclusions and future research

This study investigated the perceptions that sport and exercise sciences students and TAs have, and the use they make, of grading rubrics to inform report writing and grading,

respectively. Across all participants, perceptions of the rubrics were generally positive; that is, the rubrics were seen to be clear and assisted students to write reports and TAs to grade them. With these points in mind, grading rubrics should be seen as an important tool to be utilised across all levels of undergraduate sport and exercise sciences education.

The trends of less positive perceptions of rubrics with increasing experience at university is a finding that, to the knowledge of the author, has not yet been found in sport and exercise sciences education literature. This novel finding lays the platform for more research that could investigate why senior students differ in their opinions of rubrics compared to junior (i.e., freshman) students. Is it that the senior students need more or different detail than juniors? Or is it that the senior students have become more independent in their thinking and feel more able and willing to be critical about information and guidance given to them by instructors? Along with this, the differences in the use of rubrics to inform reflective practices between junior and senior students should be explored to understand more about their respective academic experiences. Additionally, does the complexity of work required at different levels of study influence the perceptions students have of rubrics?

The opinions expressed by TAs in the study suggest that teaching and learning training is important for professional development at a university. With a large percentage of TAs admitting to not using the rubrics, a question of how much the TAs' perceptions of rubrics influence student perceptions of rubrics arises. Exploring the relationship between TA and student perceptions of rubrics would be a valuable next step in understanding more about the interaction between instructors, students and educational resources – that is, if educators do not value or use the educational resources provided, why should students? While TAs bring excellent content knowledge to the laboratory or tutorial room, they may have limited experience in leading groups or in teaching situations.

Acknowledgements

The authors did not use generative AI technologies in the creation of this manuscript.

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Acknowledgements.

The author would like to thank Professor Chris Button and Dr Tina van Duijn for helpful comments about early drafts of this paper and the students and teaching assistants who participated in this research.

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Appendix

Student perception questions.

The rubric uses language that is easy to understand.

The rubric clearly defined the criteria required for each level.

The rubric helped me understand what was wanted on this assignment.

I used the rubric while completing the assignment.

Did the process make you start your report earlier?

The rubric is a fair way to assess assignments.

The feedback provided on the rubric was useful.

The rubric helped me know what I was doing well.

The rubric helped me know what I needed to work on.

I know what grade I will receive for the report.

The rubric helped me to write a better report.

Demonstrator perception questions

The rubric uses language that is easy to understand.

The rubric clearly defined the criteria required for each level.

The rubric helped me understand what was wanted on this assignment.

I used the rubric while grading the assignment.

Did the rubric make your task of grading easier?

The rubric is a fair way to assess assignments.

The feedback provided on the rubric was useful.

The rubric helped me know how I should grade an assignment.

The rubric helped me know what feedback I could provide.

The rubric helped me to be a better grader.

Free text comment guidance.

What comments do you have about the rubrics that were provided this semester?

E.g., What did you like about them?

Can you suggest any ways the rubrics could be improved?