Chapter 14
Can Online Rubrics Develop Learners' Metacognition?
A Qualitative Case Study Analysis

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ABSTRACT

The growing use of rubrics as tools that can enhance students' learning has prompted an accompanying growth of rubric research in higher education, with a wealth of positive findings. As of yet however, these investigations have predominantly focused on paper-based rubrics or their digital static equivalent rather than truly online rubrics, which present a paradigm shift in how rubrics are displayed, accessed, understood, and interlinked with student text and feedback through the digital affordances of hyperlinking. Studies that have investigated online rubrics so far have focused on pragmatic concerns like efficiency or satisfaction with use, which are important aspects of any digital tool, but secondary to learning. The authors therefore carried out longitudinal case studies to investigate what impacts, if any, the online-ness of rubrics had on students' metacognitive development. Results show strong potential for online rubrics to enhance metacognition, but unfortunately in the majority-used platform we investigated, online rubrics currently are more hindrance than help.

INTRODUCTION AND BACKGROUND

While there have been strong criticisms of rubrics for instrumentalising knowledge and limiting learners' cognitive and metacognitive development (e.g., Torrance, 2007; Sadler, 2009, 2014), much of the criticisms have been found to rely heavily on anecdotal evidence (Panadero and Jonsson, 2020). There therefore continues to be a need for careful, empirical exploration of well-implemented rubric use to understand how and where they can improve learning. We are now approaching a level of robustness

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in the literature where positive rubric findings of the past 20 years are being confirmed through alternative methodologies. For example, a review of all relevant empirical studies of rubrics for learning (as opposed to e.g., improving marking) conducted in 2013 (Panadero and Jonsson) found noteworthy benefits for students through making assessment criteria transparent thereby reducing anxiety and aiding metacognitive developments such as self-efficacy and self-regulation. However, the same review also found these benefits were hard to credit to rubrics alone given the "instructional interventions", such as teaching of self-assessment skills, that often formed part of the rubric implementation. Nine years later, a tightly controlled empirical study (Krebs, Rothstein and Roelle, 2022) did indeed find that with equal instructional intervention, the use of a rubric as opposed to a non-rubric self-rating schema improved students' self-judgement while at the same time lessening their cognitive load of doing so.

These studies indicate an increasing understanding that rubrics are a useful tool in improving students' metacognitive learning, and yet, despite this positive evolution, there has been no research into how rubrics impact metacognitive development when used in the online space where they, along with much other feedback and assessment, progressively occur. There have been a few investigations into the use of online rubrics, but as is common with research on digital tool use, the affordances of the tool take centre stage rather than consideration of true learning benefit. For example, use of online rubrics has been found to increase teacher efficiency by reducing the amount of time it takes to create feedback (Anglin et al., 2008; Atkinson and Lim, 2013): a worthy benefit, but one we would hope to find from any paper-to-digital switch, and not one that demonstrably improves student learning. Relatedly but perhaps more learning focused, another study (McKinney, 2018) found that a well-planned implementation increased both teacher satisfaction, because by shrinking their marking time it allowed them to give better feedback, and student satisfaction, because the grading was clearer and the feedback more helpful. This starts to make the argument for rubrics in the online space for learning rather than teaching or administrative enhancement, but as any educator knows, increased student satisfaction is not the same thing as increased learning. Another investigation found the assessment analytics possible with online rubrics allowed potentially useful comparisons of feedback and marking practice across a teaching team (Reed, Watmough and Duvall, 2015) which is again a useful benefit (when handled with a sensitive understanding of what analytics mean) but also again one that focuses on teachers and perhaps quality assurance rather than students' development. A likewise tangentially related study that looked at online rubrics used in a MOOC (Ashton and Davies, 2015) found that if students were given rubrics with guidance as opposed to just plain rubrics, they were better able to assess their peers, revealing nothing about online benefits or drawbacks to rubrics (besides the obvious point that online rubrics can be used in online environments at scale) but instead emphasising the previously noted findings that instructional intervention will help rubrics (or indeed any new learning approach) be successful.

The current situation is that despite useful studies into the pragmatic aspects of online rubrics, it has not yet been investigated whether and how the affordances of online rubrics can impact students' metacognition in terms of self-knowledge (i.e., awareness of own strengths and weaknesses, motivations and goals), procedural knowledge (i.e., knowledge of learning strategies), contextual knowledge (i.e., knowledge of academic and cultural norms, tasks and strategies) or self-regulatory processes (i.e., ability to reflect on, monitor and evaluate own learning) (Flavell, 1979; Wenden, 1987; Schraw, 1998; Pintrich, 2002; Rhodes, 2019). This chapter will therefore examine to what extent students' engagement with online assessment rubrics impacts their metacognitive knowledge and control. We will focus on exploring learners' encounters with online rubrics as a series of "metacognitive experiences" (Flavell, 1979) that are multidimensional, dynamic and person-specific (Butler and Winne, 1995), and might

involve varied degrees of affect, cognition and reflection. For the online rubric platform, we will investigate Turnitin Feedback Studio as this is what our students commonly encounter at our institution, a UK university, and is also widely used across the sector (the company's marketing copy claims it is used at 15,000 institutions worldwide (Turnitin, 2021).

METHODOLOGY

We chose case studies as the analytic framework for our research design to fit with the inherently qualitative nature of what we were trying to observe (Creswell and Creswell, 2023) and also as the best way, as viewed in our field, to capture "thick data" on intricate and interacting circumstances (Dornyei, 2007 p.155). Each of the student participants in this research is considered as an individual case, allowing us to follow in detail and observe over time online rubric use "in its natural context and from the perspective of the participants involved" (Gall et al., 2003 p.436). To be sure participants would encounter online rubrics in their studies, we recruited from within our School unit, a Language Centre which teaches English for Academic Purposes (EAP) to students joining our university from non-English speaking backgrounds, as all our courses use online assessment and feedback, including formative and summative rubrics. Students were recruited through promotional talks, and none of our own students were recruited given potential concerns around power dynamics. All volunteers had one-to-one sessions to ensure full understanding of the consent form before signing, and data collection began in the autumn semester of 2019. Given the longitudinal nature of the study and the rising pressures of Covid at the time, there were several dropouts, and we were left with three case studies. We recruited a further two students for a single semester the following academic year (2020/21) to bring the total to five; see *Table 1* for a summary of their basic info.

Table 1. Student participants

Student identifier	Gender	Nationality	Level of study	Future degree
S1	F	Kuwait	Pre-masters	MA Education
S2	F	Kuwait	Pre-masters	MSc Medical Imaging
S3	F	China	Pre-masters	MSc Advanced Computer Science
S4	F	China	Pre-masters	MA TESOL Studies
S5	M	China	Pre-masters	MSc Electrical Engineering and Renewable Energy Systems

Each student participated for at least one semester (3 months) of study, allowing us to observe how they interacted over time with the multiple online rubrics they received. The nature of the intensive EAP courses they were on, with a minimum of 15 taught hours per week, meant they had several feedback points throughout each semester, predominantly on academic writing tasks, some of which included formative feedback on draft work followed by summative feedback on final submissions.

To observe their online rubrics interactions with as minimal intrusion as possible, we asked the students to record a screencast of just their laptop screen (no camera) as they accessed their online feedback

at a time and place amenable to them. In addition, we asked them to follow a think-aloud protocol as they went through whatever online feedback interactions they wished. While this may have impacted the naturalness of the recording somewhat, this impact appeared to diminish over time and also allowed us a necessary window into the students' thoughts and reactions. Students were given one-to-one training in how to make screencasts and carry out think-alouds. To reduce the cognitive load and improve the accuracy of the screencast think-aloud, we encouraged participants to engage in a non-metacognitive verbalisation (Bowles, 2010): they were asked to report what they were doing without necessarily interpreting all their thoughts, feelings or behaviours while they were doing it (i.e., why they were thinking or doing something, or why they were feeling in a particular way). Moreover, the think-alouds were concurrent in that students were reporting while performing the task (i.e., accessing and reviewing their online feedback), thus ensuring higher accuracy of the think-aloud (Ericsson and Simon, 1993).

No training about rubrics was given as this would have introduced the instructional intervention variable noted in previous studies that muddies the waters in terms of what is causing learning affect. However, some students did receive training about rubrics from their teacher, details of which were ascertained in later interviews. Notably, no students had been given instruction in accessing or navigating the online rubrics. Students were asked to make a screencast with a think-aloud every time they received new online feedback on a task. For 4 of the 5 students, the first feedback point they recorded for us did not use an online rubric – the teaching focus seemed to be more on getting students to submit a short initial task and understand how to use the system to access feedback comments. We purposefully did not specify to students that we were only interested in rubric feedback as that would have influenced the results; instead, we welcomed all screencasts students wished to share with us, and later followed up each screencast, or for each set of screencasts as timing required, with semi-structured interviews to discuss the interactions (or non-interactions) observed on screen.

The interview schedule started with open-ended questions about what the student thought about each task and accompanying feedback, before probing more specifically into what they did with the feedback and what they thought about the rubric. For part of the interview, participants were also asked follow-up questions based on their screencast think-alouds using a stimulated recall protocol (Gass and Mackey, 2016): they were shown stills or footage from their screencasts and asked to retrospectively explain or expand on the thinking behind their online behaviour or verbalisations recorded in the screencast. We wrote up brief contact summary sheets for each student after each initial interview and added to the sheets as interviews progressed to note any salient points and allow for further triangulation when revisiting the data.

The screencast think-alouds (n=18) and interviews (n=12) were transcribed with all data anonymized and each case study's transcriptions arranged chronologically; see Table 2 below for a summary of the data points. The students' written work and teacher feedback were not collected directly but instead viewed via the screencasts, providing additional data as needed for analysis. For this reason, and for other visual and auditory data beyond what was transcribed, the videos were continually revisited during the data analysis. Although we initially attempted a coding approach to each case study, carried out individually and then comparing between researchers to check interrater reliability, we found that this more formal method created an overly fractured view of both the multimodal nature of the data and of the student-centred narrative enquiry at the heart of the study's purpose. We therefore switched to a broader narrative analysis approach, reiteratively reading each data set to identify each student's themes of feedback use, rubric use, and metacognition. Similar case study analysis is common in English as

Second Language research, and as with, for example, Leki's case studies (1995, 2001), we analyzed not just for recurrent themes but for single instances that stood out due to the students' reactions (2001, p.46)

Table 2. Data gathered for each case study

Student	Semester 1, 2019	Semester 2, 2020	Total
S1	• 3 Screencasts of formative work • 1 Screencast of summative • Interview	• 1 Screencast formative • Interview • 1 Screencast summative • Interview	6 screencasts, 3 interviews
S2	• 2 Screencasts formative • Interview	• 1 Summative screencast • Interview	3 screencasts, 2 interviews
S3	• 2 Screencasts formative • Interview	• 1 Screencast formative • Interview • 1 Screencast summative • Interview	4 screencasts, 3 interviews
	Semester 1, 2020		**Total**
S4	• 2 Screencasts formative • Interview • 1 Screencast summative (of 2 separate tasks) • Interview		3 screencasts, 2 interviews
S5	• 1 Screencast formative • Interview • 1 Screencast summative • Interview		2 screencasts, 2 interviews

It is worth noting that these screencasts and interviews furnish direct quotes in the case studies below, which we have left as recorded or only edited minimally, e.g., to remove repeated words. The reader may therefore notice the quotes do not always follow English conventions they may expect. It is our deliberate choice to use the authentic expression of these multilingual speakers to respect their voices and see what we can learn from them, rather than judging their linguistic proficiency in English as a representative of their whole selves (see Ryan and Viete, 2009 for an analysis of the barriers international students routinely face with this).

THE DIGITAL FEEDBACK LANDSCAPE

Necessarily, the interactions of each student with their online rubrics were mediated by the online platform. It is therefore important to delineate the digital feedback landscape these students navigated. Within the Turnitin platform used, there are three main types of feedback possible, which we refer to in this study as follows:

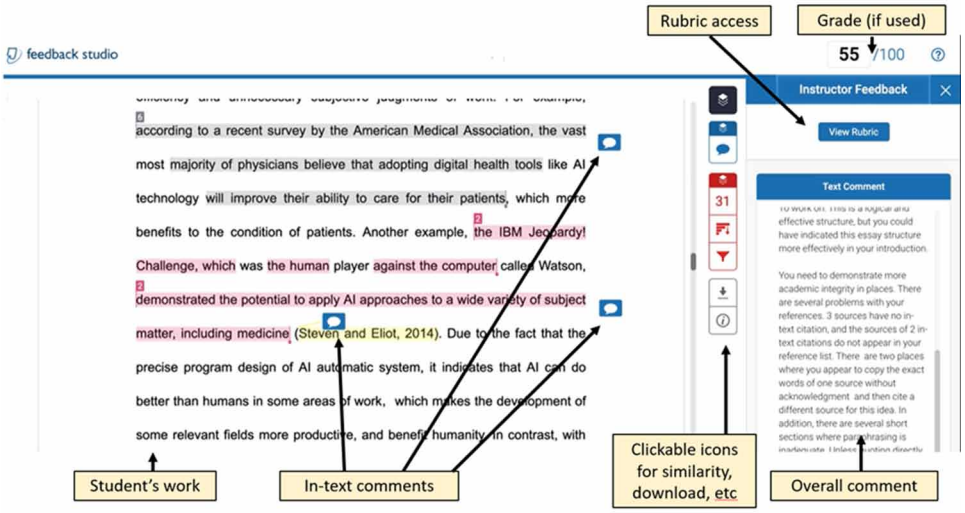
1. **Overall comment** – a text box which displays down the righthand side of the student work and is always visible, remaining in place as the student scrolls up and down.

2. **In-text comments** – text boxes which are either attached to a teacher-chosen section of text (of any length) or which are free-floating, appearing at a selected point. The student must scroll to the relevant places in the text to see these. They appear as little speech bubbles, which must be clicked to open and read fully, though in some cases a title of the comment type (e.g., Structure) and/or an icon indicating the comment is linked to a rubric may show on the unclicked view if the teacher has used these functions.
3. **Rubric** – the rubric feedback is accessed through a "View rubric" button which is always on display above the Overall comment. (In cases where a rubric has not been used, the button is still present but greyed-out.) Once clicked, the rubric opens in a separate window, usually on top of the student work. It appears as a standard rubric grid with levels of performance across the top and criteria down the side. Where linked Feedback comments have been used, a speech bubble with the number of linked comments displays next to the rubric criterion, and clicking it brings up a list of linked comments which can then be selected to jump to that comment in the work.

In addition to these feedback types, teachers are also able to highlight text, insert text, and cross text out, however these types of feedback were used very rarely in the case studies and are far removed from our focus on rubric interactions: we therefore do not consider them in this study.

As well as these feedback presentations, students are also presented with a grade in the top right if a grade has been given, and a set of clickable icons down the righthand side of their text relating to their "similarity score", i.e., how much of their text is the same as other sources or previously submitted student work according to Turnitin's database. Where text is deemed to be the same, it is automatically highlighted with a different colour given to each Turnitin-identified source. Finally, beneath the similarity icons are two further clickable icons which allow students to view info about their work, and to download it. *Figure 1* below shows the students' main feedback view.

Figure 1. The digital feedback landscape



THE ONLINE RUBRICS

Within this feedback landscape, the rubrics were the focus of our investigation, although as noted we did not guide the students to the rubrics or emphasise them, thus allowing students' natural interactions with the online feedback to emerge. All students had access to Word document versions of the rubrics on the Virtual Learning Environment (VLE),though not all made use of this, but within the Turnitin platform where they actually got their feedback the rubric is somewhat hidden, requiring an additional click to open, and once opened it occludes the student work so that the full rubric can be viewed instead. Impacts from these seemingly small digital necessities are discussed in the case studies below. The rubrics themselves were analytic and task specific (Jonsson and Svingby, 2007), though the specificity was at the level of task type, e.g., academic essay writing. They had 5-7 criteria which, in the summative use, each had different weightings that were automatically aggregated into a total score (in the formative, no weightings were present and no score generated). Many of the criteria were "fuzzy", requiring the teacher's qualitative judgement of "abstract mental construct[s] denoted by a linguistic term which has no absolute and unambiguous meaning independent of its context" (Sadler, 1989, p. 124), e.g. "sufficient" vs "good" understanding of the task, though efforts had been made through the criterion level descriptors to sharpen this where possible, leading to relatively lengthy descriptors that noted multiple elements. See *Figure 2* below for an example rubric view from one of the case studies.

Figure 2. Example summative rubric view

Perhaps the most significant online display element for these rubrics was the number of performance level bands or scores. While it is widely acknowledged that fewer – perhaps down to even just three – score levels is most impactful (Suskie, 2017, p.552), these rubrics had many levels, requiring students to scroll right and left across the rubric window to see which cells had been selected. For the formative rubrics, there were 5-6 levels, while the summative ones took all but the highest and the lowest levels and divided them into 3 to allow marking at the high, middle, and low point of the band. This resulted in an unwieldy number of levels, requiring the student to scroll left and right to see them all (note how only 4

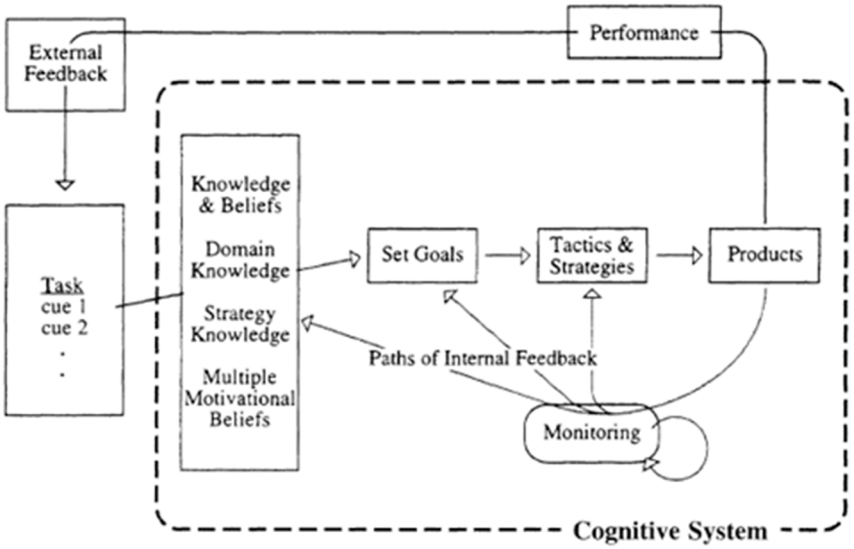
of the many bands show in *Figure 2*), but was seen as necessary at the Centre due to external pressures of meeting UK Visas and Immigration language proficiency stipulations and also university numeric grade expectations. Whether these fine-tuned differences could be adequately assessed or represented in the rubrics is beyond the scope of this study, however it is useful to observe students interacting with rubrics that seek to meet the needs of multiple stakeholders, likely not an uncommon experience.

METACOGNITIVE JOURNEY FRAMEWORK

Our approach to analysing participants' metacognitive journey is informed by Flavell's metacognitive framework (1979), in which he distinguishes between metacognitive knowledge of self, task and strategy, on the one hand, and metacognitive experiences as "any conscious cognitive or affective experiences that accompany and pertain to any intellectual enterprise" (p.906), on the other. In this conceptualisation, metacognitive self-knowledge refers to the declarative knowledge of one's abilities and motivations; procedural knowledge refers to general awareness of learning strategies and how to use them (e.g., how to skim or cite); and strategy or contextual knowledge refers to situated understanding of the strategies and knowledge that may be deployed in specific tasks and different contexts (Pintrich, 2010; Schraw, 1998). Metacognitive experiences have a somewhat different function: they act as catalysts, often occurring in situations that "stimulate a lot of careful, highly conscious thinking": they can signal the emergence of metacognitive knowledge into consciousness, or they can add to, revise, or delete from the existing metacognitive base (Flavell, 1979, p.908). Examples of metacognitive experiences might include suddenly feeling clear about a task, unexpectedly recalling having completed a similar task in the past, believing that a problem is easy, or feeling confident about a specific learning strategy (pp.906-8).

Scholars have also drawn attention to the importance of self-regulatory processes in metacognition, which encompass a range of activities that "help students control their learning" (Schraw, 1998, p.114; also, Rhodes, 2019) such as planning a task, monitoring task performance, revising goals, or evaluating the effectiveness of learning strategies. In their model for self-regulated learning, Butler and Winne (1995, see *Figure 3*) identify the importance of feedback – both externally generated by tutors and peers, and internally generated by learners themselves:

Figure 3. Butler and Winne's model of self-regulated learning
(1995, p. 248)



They argue that the quality of external feedback, and this would include online rubrics, can impact learners' affective dispositions towards their perceived achievement, which in turn might influence – positively or negatively – their monitoring of goals (self-knowledge), adjustment of strategies (procedural knowledge), and specific task engagement (contextual knowledge). For effective self-regulation to occur, therefore, feedback practices should be developmental and dialogic, not just outcome-oriented, in order to help close the gap between current and desired performance, provide clear guidance to ensure uptake, and take into account the role of learners' prior knowledge and beliefs about the subject, learning and themselves as these might skew how formative messages are interpreted (Nicol and Macfarlane-Dick, 2006).

What is often highlighted in conceptualisations of metacognition and self-regulation, as well as their relationship to feedback, is the "recursive" nature of the information flow and knowledge construction processes:

students may modify their engagement by setting new goals or adjusting extant ones; they may reexamine tactics and strategies and select more productive approaches, adapt available skills, and sometimes even generate new procedures. If external feedback is provided, that additional information may confirm, add to, or conflict with the learner's interpretations of the task and the path of learning. As a result of monitoring task engagement, students may alter knowledge and beliefs, which, in turn, might influence subsequent self-regulation (Butler and Winne, 1995, p.248).

Given the multiple and complex processes involved in self-regulation, Butler and Winne (1995) acknowledge that existing empirical research on feedback and regulatory processes tends to aggregate data and thus potentially "fail to reflect the variance in [learner] behavior" (p.246) or the dynamic nature of metacognitive knowledge and self-regulation. Therefore, our approach to the collected data on students'

use of online rubrics was exploratory, i.e., we were interested in mapping out our participants' multiple encounters with online rubrics as metacognitive experiences that might have triggered or inhibited the emergence of a particular type of metacognitive knowledge and self-regulatory behaviour. At the same time, we also aimed to acknowledge the differential impact online rubrics had on our participants' metacognition and the dynamic nature of metacognition and learning in general. Thus, we traced each participant's journey over time, which might have not always been linear or progressive (as Butler and Winne have argued). Our analysis of each case study therefore traces the metacognitive journey by starting with the initial state of their self-, procedural and contextual knowledge and self-regulatory processes, moving on to describe their metacognitive experiences of online feedback and rubric (non)use, exploring the rubrics' impact on the learners' metacognitive knowledge development, and identifying any adjustments to, revisions of, or persistence with metacognitive knowledge and behaviours.

The richness of the data combined with our non-directive, enquiring approach allowed us to trace multiple metacognitive experiences in each student's development. Inevitably for such a large, qualitative data set, many of these metacognitive experiences were not directly rubric-linked, but still formed a necessary part of the larger case study picture that allowed us to build rapport with the student and also let their online rubric use emerge naturalistically, a key goal given previous shortcomings noted in the literature. Each case study's rubric-related metacognitive experiences are given below, in the order presented in *Table 1*.

S1 CASE STUDY: COMPETENT RUBRIC USE BUT METACOGNITIVE GROWTH OFFLINE

S1 was a confident, aspirational student with previous teaching and publishing experience, and the ambition to apply for a doctoral study after her Masters'. She had already been studying EAP at the Centre for one semester previous to this research, and was committed to the project, recording additional screencasts and volunteering for project activities. S1 was aware of online rubrics from the start of her involvement with the project, being the only participant to refer to them in her screencast think-aloud upon receipt of her first rubric-referenced feedback. During the project, she developed this awareness of rubrics into a deeper understanding: from seeing rubrics as an important codification of teacher expectations and achievement levels to a tool for prioritising learning strategies and monitoring of progress in different academic literacies. This metacognitive growth, however, was not necessarily down to online rubrics; as S1 was to discover, their inaccessibility pre-submission and limited functionality post-submission often made it impossible to engage in the type of learning, self-knowledge, and self-regulation she was after.

From the start, S1 demonstrated assured declarative knowledge about herself as a learner, and unlike other project participants, and a significant proportion of EAP and university students more generally, S1 read into the tutor feedback a fairly balanced reflection of her abilities rather than seeing it through an exclusively deficit lens (Benesch, 2001). In her first screencast think-aloud, for instance, S1 showed insight into her learner self by agreeing with her tutor's feedback that grammar was her weakness, but also challenging her tutor's assessment of her reading skills as she knew this to be a strength, just one that her writing did not yet show:

I have some issues here and really I know about them. Structure of sentence and this is my weakness. … [Reads tutor's overall comment.] "You also do not seem 100% clear on what the article is saying." Uh,

really, I do my best, and I think I understand the reading of the articles. But the difficult when I want to express my point.

S1's self-knowledge was also punctuated by feelings of intellectual challenge, and investment to improve. This range of metacognitive experiences was further supplemented by S1's confidence, which she showed by not merely reading verbatim her tutor's comments but by responding to the feedback, a sign perhaps of her pre-existing high self-esteem, recognition of the benefits of praise, and willingness to learn from past mistakes (Young, 2000):

[Reads tutor's overall comment.] "Good. You appear to have read a lot, and have tried to synthesise these sources...." Actually, really it is difficult to organize the idea because the thematic essay is need to simplify the idea and organize the paragraph in logic. So, I think here I have to improve... "You need to simplify your organization. This may mean you rewrite an outline." So, what I have to do to recognize all these details and try to improve and rewrite the outline. All this. Because, really, I have good sources… But I have to just re-outline.

What can also be seen is that S1 did not merely report experiences such as challenge, effort, or confusion that the encounter with feedback had triggered. Rather, she drew on these as a springboard for deeper learning and motivation, which has been linked to improved self-regulation (Zimmerman, 1990). In other words, her initial confidence about her successful use of sources seems to have provided S1 with a clear sense of direction on what to work on next (structure), and possible learning strategies (rewriting and outlining).

It was at this point that S1's first experience of online rubrics occurred, even though it was limited to identifying her performance level for each criterion:

And here we have "View rubric". It's important to know where's my position. So, in the… first draft, I have "Some way from Pass" on the whole text. OK. And I have also for the "Development of idea/ argument" ... I need to work hard just to achieve… the "Pass" level.

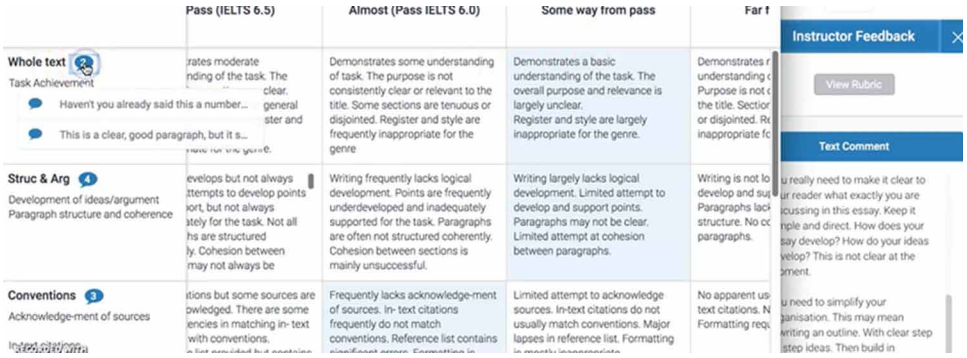
While identifying her achievement level ("Some way to Pass"), she also begins to use the rubric for self-monitoring, noticing her "position" against individual criteria. This reviewing of criterion scores has been noted as a beneficial approach to rubric use for self-regulation (e.g., Andrade and Du, 2005). Furthermore, the encounter with the online rubric seems to have prompted S1 to begin self-regulatory reflection on the amount of effort required to improve in these specific criteria ("I need to work hard just to achieve ...the 'Pass'"), in a way not dissimilar to her earlier comments about her drive to do well, to work hard and address challenges, which revealed her growing self- and procedural knowledge.

This somewhat basic online rubric use post-submission was complemented by S1 using the rubric pre-submission to inform her work, something she had not done in the previous semester (before this study). As she explained in the follow-up interview, S1 had been made aware of rubrics – tutors "show us a file for all documents we need for the essay, and they explained everything" – but she did not make use of them at that time as she "didn't know how to work with them", confirming other findings in the literature that instructional intervention is often insufficient to promote informed rubric use by learners (Brookhart and Chen, 2015; Johnsson and Svingby, 2007; Panadero and Johnsson, 2013). At this point in her studies, however, S1 was able to engage, downloading the Word document version of the rubric from

the VLE and using it from the start of her writing process to "focus on each part [criterion] to reach all the goals they [tutors] need". Metacognitively, this shows her evolving procedural knowledge for rubric use, but importantly for our focus, not one that uses online rubrics. Due to the lack of functionality of the feedback platform to enable the pre-submission use of interactive rubrics by learners (Robbins and Marinkova, in press), this element of S1's rubric-driven growth happened all in the static, downloaded document space.

When S1 did make use of the online rubric, she bypassed its interactive features despite her ease navigating the rubric space – using the scroll bar to see the selected score levels, moving the rubric around, zooming in and out of the rubric. In her screencast think-aloud (see *Figure 4*), it can be seen that the in-text comments in S1's script were hyperlinked to specific rubric criteria, which should have enabled positive "synergy effects" of the two feedback channels: the overall achievement level and key areas for long-term improvement explicated via rubric criteria should have worked in tandem with the specific instances that require immediate action highlighted in the in-text comments (Nordrum *et al*., 2013, p.930). However, when S1's cursor hovered over the online rubric criteria and the hyperlinked in-text comments appeared briefly underneath, she did not take any notice. In this sense, the potential of online rubrics to provide the in-task synthesis of different feedback elements was not realised. Instead, S1 appears to have approached the online rubric as a separate digital space: she proceeded to read out loud each highlighted performance level without linking the criteria to tutor in-text comments on the script (or overall tutor comment, for that matter). This separation was compounded by the need for the online rubric to open in a separate window, which covers the student script and other feedback – the hyperlinking functionality failing to overcome this separation.

Figure 4. S1's view of in-text comments hyperlinked to online rubric criteria



For S1, then, the onlineness of rubrics did not seem to have played a major part in her metacognitive journey – or at least not in a positive way. When reflecting on her use of online rubrics pre- and post-submission, she pointed out that the static version had been more conducive to her learning and regulation before submitting a task: "I prefer to download and print the copy and determine to read more in details and make highlights for some section that I have to focus." When S1 downloaded the online rubric post-submission to monitor her feedback, it did not appear as a table but as a very long list of descriptors, which made it hard to make sense of the academic expectations at different performance levels. The student also struggled taking screenshots of the rubric to be able to use it simultaneously with

her script – the view of the latter being blocked when the rubric opens in a new window – thus preventing the use of the rubric to identify specific instances of strengths or challenges, or to monitor recurrent errors. In fact, it was only when S1 worked with the rubric offline or in hard copy that she was able to analyse criteria and apply them to her work pre-submission for self-assessment, or to her achievement level post-submission for progress monitoring:

I prefer to save all document in one file just to see the improvement… Folder for Level 2, and folder for Level 3… for all feedback together… I download the PDF. Feedback overall. And …the comment in details… I put all their recommendation in one file. And… make a schedule to plan how to improve myself and I list the main problem because there are some repetition of the mistake... and there is some main important skills in writing that I have to improve also. Even if I'm good in it, but I have to be focused and not forget… how to write.

It was the folder she had created in the offline / paper space that enabled S1 to integrate all elements of her feedback – overall comment ("Feedback overall", "recommendations"), in-text comments ("comment in details") and rubric – to monitor her progress not only within a task ("see the improvement"), but also across assignments and courses ("Folder for Level 2, and folder for Level 3"). In contrast, and somewhat paradoxically, in her encounters with the interactive rubric, S1 would approach it as a separate space; to integrate it with other feedback elements, she had to leave the online medium.

For all the limitations of the online medium, rubrics in general seem to have had impact on S1's metacognitive growth. The participant regarded her initial approach to rubrics as limited – she "downloaded [the rubric file] at the beginning of this semester, just to understand what they [tutors] need". However, by the second semester of this study (which was confusingly called Level 4 for her), in addition to using rubrics to develop her assessment literacy pre-submission, and to monitor her progress post-submission, S1 seems to have noticed their potential to be a useful "instruction" to learning:

Actually, in Level 3 I didn't consider importantly for the rubric. In Level 3, I just focussed … "Yes, this is score, it will be fine". But I didn't at the beginning to consider the instruction. But really, I found this is important to help me.

In terms of their motivational impact on self-knowledge, rubrics seem to have led to a shift in S1's metacognitive experiences. If in earlier encounters, her online rubric-enabled self-positioning brought a degree of satisfaction at achieving a grade ("the score"), at the end of the semester S1 voiced an awareness of rubrics' learning potential, but a potential which is learner- rather than tutor- driven: with students looking back at earlier assignments, comparing achievement and feedback, devising appropriate learning strategies:

At the end, I saw how is the progress of the feedback. And when I returned back for the first draft, and I compared it with the final, we can see how they improve the mistake and academic writing. And this one it depends on the student, how they are dealing with the feedback.

In this sense, therefore, it was S1's response to the often unwieldy online rubric, i.e., move offline, download, collate all feedback, which showed the student's metacognitive knowledge in all dimensions – of self, of context and of self-regulation. S1's self-knowledge was enhanced as her offline approach

to rubrics helped her notice patterns in tutor comments, identify areas of strengths and challenge, and devise effective learning strategies. It might be argued that the layout and accessibility limitations of the online rubrics pushed S1 into developing further her procedural and contextual knowledge of how to usefully deploy these particular online rubrics. And finally, S1's decision to collate her feedback from various assignments to monitor her performance demonstrated her self-regulation, an approach over which she had more ownership than the feedback platform would allow. These conclusions echo recent challenges of the allegedly "representative" function of rubrics, seen as offering absolute transparency of what is otherwise opaque "institutional intentions" and processes (Bearman and Ajjawi, 2021, p.362), a promise reiterated even louder by the interactive affordances of online technologies. Instead, after having encountered a number of barriers to the promise of transparency and failing to notice the interactive possibilities, S1 decided to create her own "productive space" (Bearman and Ajjawi, 2021, p.363), albeit using static / paper technologies, where she was able to make sense of criteria, use feedback to map progress, and advance her learning.

S2 CASE STUDY: RELUCTANT AND INSTRUMENTAL RUBRIC USE

S2 was an engaging, funny student who expressed herself strongly throughout the study: there was much she did not like about the online feedback she received, and she was very comfortable sharing that in her screencasts and interviews. She was extrinsically motivated, noting her wish to get a high grade, but she also took feedback very personally (negative feedback made "all the weekend bad"), revealing a deep care for her work and a wish for her efforts to be understood and acknowledged, ideally praised ("I do hard work, I need someone to appreciate me not to told me... you didn't understand"). Her struggle with the affective dimension of feedback literacy, her ability to "harness the emotional impact of feedback" (Winstone and Carless, 2022, p. 27), was one of the main barriers to her developing higher metacognitive skills of self-regulation. In the first semester, this barrier took the form of negative reactions to the negative feedback she received, while in the second semester, with a new teacher who had a more positive feedback style, it took the form of a continued reliance on the teacher to tell her what to do. Although she was aware of the existence of the assessment rubric from the previous term (before this study commenced), she did not use it at all in Semester 1 because her teacher "didn't send for me". This shows her teacher-responsible view of learning, as the students were expected to access the rubrics through the VLE and through the feedback platform, but also indicates a possible barrier in the online rubrics' lack of visibility. Rubric awareness only emerged in the second semester, and never formed part of her learning or metacognitive development.

Early on in semester 1, S2 went through a significant and relatively common metacognitive experience in many students' lives: she received feedback indicating her work was not as good as she had thought it was (see Rhodes, 2019). In her first screencast, on a casual writing task that she understood to be low-stakes, this disjuncture between expectation and experience did not occur; there were both positive comments and relatively minor suggestions which she was able to take in stride and respond well to: "I like this one feedback, something to encourage me. ...Thank you. ...Okay. Work, I will work." While these responses show undeveloped learning strategies ("I will work") and a very basic emerging self-knowledge about weaknesses, they nonetheless evidence S2's ability to reflect on non-threatening task feedback. However, by her second screencast, with a weightier academic writing task at hand and a preponderance of negative feedback comments, she responded instead with an argumentative and

unhappy tone: rather than engaging fully with the Overall comment – which is also the place where she could have accessed the rubric for further feedback on strengths and weakness of the overall work, she quickly skipped over it and instead moved to the more granular In-text comments. In the screencast, she did not access the rubric at all and instead worked through the in-text comments one by one, often challenging them as wrong and then moving on quickly:

What he wrote for me? [Clicks on in-text comment, reads:] "The form of the verb used is incorrect." Why? This sentence exactly I did before and the same teacher told me it's OK. Why it now wrong?

[Clicks on next comment, reads:] "There is missing words." Not clear for me.

As per Butler and Winne's (1995) model of self-regulated learning, the perceived quality of the external feedback had a negative impact on S2's affective disposition, creating an initially negative metacognitive experience (Flavell, 1979). Despite this, the follow-up interview revealed that after the initial feedback interactions she recorded in the screencast, S2 then returned to the feedback multiple times at different points, printed out her work and annotated it based on the feedback, and made an appointment with her tutor to discuss. The full metacognitive experience therefore shows both that she is beginning to develop the contextual knowledge of how to navigate academic culture and strategies for academic writing, and that the challenge to her self-perception of her work has begun to evoke nascent self-regulatory processes and self-knowledge. In the face of such a challenge, it is unsurprising that S2 did not have the mental energy to take in other elements of the digital landscape, in particular the View Rubric button. The online-ness of the rubric in this case made it completely occluded: either she did not see or understand how to use the button (most likely given her unawareness of the rubric revealed later in the interviews and also her low digital proficiency displayed during the initial one-to-one sessions for this study), or she chose not to click on it because she did not value the rubric.

In the second semester her screencast think-aloud had a much happier tone, with explicit gratefulness to her new teacher who gave feedback that she confirmed in her interview was much more her preferred style (very positive, explicit about corrections). Throughout the recording S2 responded positively to this difference, e.g., "Thank you. I'm happy now. This teacher is different [than] before. Always support me and improve my spirits. She always optimistic." While the affective dimension of her feedback experience was therefore much improved, she did not appear to show metacognitive development in terms of self-knowledge or self-regulatory processes, being dependent on this positive kindness to point out her strengths and weaknesses and to directly tell her how to fix errors, nor was there any demonstrable metacognitive growth in her procedural knowledge, such as learning strategies, as her go-to strategy when she did not understand the feedback remained to ask the teacher:

sometimes [in-text comments] like, "punctuation", or something "word" or "verb", I'm confused I don't know where's the answer. So, I'm waiting for the next meeting to discuss this point with my teacher.

In this lack of development, she confirms Hattie and Timperley's (2007) combined meta-analyses findings that personal feedback or praise, though much liked by students, is often an ineffective type of feedback, rarely creating learning gains. Indeed, this more positive second semester feedback reaction cannot truly be characterized as a metacognitive experience as it did not seem to "stimulate a lot of careful, highly conscious thinking" (Flavell, 1979, p.908), but rather good feelings and continuation of current practice.

Nonetheless, in this semester she did engage with the online rubric for the first time, accessing it in her screencast after the overall comment, in-text comments, and grade to determine her performance level for each criterion:

OK, a "Distinction". [Points at the "Argument" criterion, reads some of the description out loud]. Thank you, thank you for this one grade; I think it's fair for me. …Oh, I have something here in "Distinction Plus". [Points at "Grammar accuracy" criterion]. I'm happy to get this one final result. OK, I'm between "Distinction" and "Plus Distinction".

In the follow-up interview, S2 stated that the rubric "is not more useful than the comment. But it is OK", showing minimal surface level engagement only, which she further refines by saying "if 'Distinction', I like it", revealing a wholly extrinsic motivation (Deci and Ryan, 1985) to using the rubric. However, such extrinsic focus is often present on these EAP courses, where students must achieve a certain level to pass onto their future degree, a context which S2 is well aware of: "it's the course, you know, the mark, it's important thing to us on the course." She elaborated on this motivation for her personally later on, noting the rubric's purpose in this use: "I read to see I'm 'Distinction' or I'm 'Merit', like this, because I have to pass not [the] same [as] people, I have to be more than another [in] this level." Whether this motivation is "external regulation" due to her need to attain a higher grade than her peers going on to programmes with lower entry requirements, or "introjection" based on an ego-driven desire to outperform her peers (Ryan and Deci, 2000), it still brings her rubric use into an understandable but unideal instrumental approach.

Specific questioning by the interviewer confirmed that the online rubric had not formed part of her writing practice (and she did not engage with the static, downloadable version on the VLE at all). Her use of the online rubric was entirely instrumental: she only looked at it post-submission to see the mark. Her screencast showed as well that, much like S1, she accessed the other two feedback elements first, the overall and in-text comments, and opened the rubric last for a one-off viewing.

While the low visibility and separateness of the online rubric may have been part of the problem, the real issue was rubric design: the lengthy descriptors and the unwieldy repetition of the same descriptors three times for the main performance levels (see Online rubrics section in Methodology above) was clearly a driver in her highly instrumental rubric use. As she explained in her final interview:

to be honest, I don't read this one sentence [referring to the rubric descriptors]. Just I saw where is the line for "Distinction", "Merit", like this. …I'm not concentration about what's in this [rubric cell] because so many sentence. And I've told you before, it's not [more] useful than the comments and the correction code. …So many sentence and boxes for slides, same levels or same "Distinction" or same "Merit", like this. So many.

Though the confusingly numerous, repeated descriptors in the summative rubric were a result of it being online in this particular platform, it is possible to design simpler rubrics in the online space, and so this barrier cannot be said to be a fault of online alone. S2's confusion can therefore be attributed partly to poor rubric design and partly to platform-specific problematic design aspects.

In sum, for S2, the online rubrics were not a success. Their occluded visibility in the online space seemed to pose a barrier to use for a significant portion of her studies, and once she did start to use them, their online-influenced poor design meant she did so instrumentally; they did not promote any

metacognitive development. To be fair, S2 did not engage with rubrics when explained in class or made available for static or offline use in the VLE either: rubrics overall had very little presence in her learning journey. Yet it is shame that the multiple "invitations" to learning that rubrics can promote (Bearman and Ajjawi, 2021) were essentially quashed by various online barriers in this case.

S3 CASE STUDY: DEVELOPING RUBRIC USE BUT METACOGNITIVE GROWTH HINDERED BY ONLINE

S3 presented as a very polite, dedicated student, perhaps a little shy, who developed well over the two semesters, with her think-alouds, interviews, and onscreen work all showing increasing awareness of academic literacies that take a long time to bed in, e.g., structuring longer work. She was worried that her language ability would be too low for us to understand in her think-aloud recordings, revealing a common discomfort that international students face when dealing with the "nativespeakerdom" of the English-speaking academy (Ryan and Viete, 2009). Despite reassurances, she chose to record her screencasts a day or so after first accessing and processing her feedback, rather than concurrently, so that she could speak more ably, leading perhaps to more reflective and less emotional recordings than might otherwise have been, but nonetheless useful windows into her feedback engagement process and furthermore ones that worked for her individual needs and preferences. Also of note in her screencasts is her adeptness at navigating the digital feedback landscape: unlike S1 and S2, she used the similarity tools via the sidebar icons (see *Figure* 1), going on to describe them with understanding despite, as confirmed in her interview, not being taught about them and simply deciding to click and explore. However, even with this technological proficiency, she did not click and explore the rubric in her first screencast, only finding it when a friend pointed it out to her, and, in common with the previous two case studies, preferred to use paper for working with her feedback:

I think paper is so convenient. I can take some notes in the paper. And I can write anything I think. I think it's so convenient but, in the computer, I think I just look at, I don't take notes. …to write some articles on the computer is okay. But when I analyze something to take notes, I want, I prefer to print.

It is notable that, as with S1 and S2, the feedback platform was for S3 an overly one-way feedback delivery system that pushed her into an offline space where she could actually engage. Similarly, though her awareness of the rubric developed greatly over the course of the two semesters observed, with a clear accompanying metacognitive growth, this appeared to be linked to rubrics alone rather than their onlineness; in fact, the online aspect was frequently a barrier to the rubric interactions S3 wanted to undertake.

S3's emergent rubric understanding was part of her metacognitive journey as a recipient and user of feedback, and it is important to note that to this she brought a significant strength which was unique among the case studies: she had already learned in her previous studies, and perhaps had a natural affinity for, seeking out peer feedback. As she noted in her very first interview when discussing actions she took from the feedback: "I also to talk about my question, my problems with my friend. And he also received the feedback, and we compared [each] other's feedback and we will also talk about how to write this article better."

Indeed, it was only through her friend's prompting that she engaged with the rubric at all. Her broader feedback journey took a traditionally bumpy-but-positive path, largely helped by her self-regulatory

processes and ability to manage the affective domain of feedback. While first S3 found the feedback "too tiring" and it made her "feel sad", she was able to recognize the cause and respond well: "before… I think my article is great… but when I see this feedback, oh, yeah, maybe I'm not so good… I have some problem I should solve." This well-noted metacognitive experience of thinking one's performance is stronger than it actually is (Rhodes, 2019) can be debilitating for students, as it was for S2, but S3's problem-solving emphasis here indicates an ability to adjust self-knowledge of weaknesses and manage the negative emotions of doing so. By the second feedback point, she approached the feedback with trepidation ("First, when I see the so long comments, I am afraid like my essay have a lot problem") but after reading, she took on a much more productive and positive stance, noting that "Yes, I have a little problem, but… have some solution to address this. It can be solved, it doesn't matter." By the third interview, she was carrying out a sophisticated self-regulatory process of monitoring her learning and development by comparing feedback from previous drafts to feedback on her final submission. Admittedly this development was scaffolded by the built-in feedback cycle of course, with feedback first on a draft followed by on a final submission, but not all students take on this learning point even when designed into the curriculum. By the end, she seemed to have reached a new level of metacognition touching not only on her self-regulation, but also on contextual understanding of the academic culture around writing expectations for postgraduates in the UK:

from the feedback, I know the importance in that the tutor is just to… guide you how to study; is just give your suggestions, is the most important thing always to do by yourself. You don't… rely to other people to help you how to write; they just to give your suggestions.

This impressive development of feedback literacy included a strong development of her use and understanding of rubrics. At first, she evidenced very little awareness of them. She did not access the rubric in her first screencast but did mention it in the follow-up interview after learning about it from her friend, noting "He taught me, but I don't attention to this, I don't know. He told me… what's the score you get, what's the band you have?" Understandably with this introduction, S3 saw the rubric as merely a tool for goal setting, stating that "I want to lift up to 'Merit' or 'Distinction'."

After mentioning the rubric at the start of her second think-aloud, she did not actually open it, instead spending 14 ½ minutes (longer than her other screencasts, and the longest of all the case studies) to carefully explain first an overview of her tutor's overall comment, then work through the in-text comments and also note the Turnitin similarity text highlights, before returning for a more in-depth engagement with the Overall comment. Her calm, methodical approach showed clearly that she valued the comment feedback, taking time with all of it, and also just as clearly that she did not yet value the rubric as it got the barest of mentions in this highly detailed account. In the follow-up interview, a question about the rubric evoked almost an apology: "sometimes I, I really forgot to click the rubric. But yesterday my friend told me… yeah, so I click it. But sometime… I really forgot to see it." When pressed for specific pros and cons of the rubric, she responded positively to the clarity, noting that it was "clear to read and so detailed. And different parts have all their own different criteria, have different standards", which appears to echo the finding from Krebs *et al*. (2022) that rubric-arranged feedback can lessen the cognitive load of parsing feedback. If anything, S3 wanted sharper divisions in the rubric, asking for specific scores for each band rather than just an indicated range so that the scores could "remind you what level you are in and what problem for you." This overly marks-focused suggestion, particularly for formative

work, shows that she still viewed rubrics as an assessment rather than a learning tool, but at least with potential for formative use.

In her third and final screencast, on feedback to a lengthy summative essay which previous work fed into, she did open the rubric and talk through it, yet the online display of the rubric, in this instance showing only 4 of the 7 criteria on screen and requiring scroll to see the rest, presented a barrier: S3 never accessed the final criterion in this screencast, despite the her highly-detailed, explanatory approach. Nonetheless, her think-aloud shows the rubric prompted useful self-knowledge development as she engaged with her performance levels for each of the different criteria:

for the "Conventions" I got 48 … is "Fail". I know, my reference, I have some errors… citation is not very well. So, from this I know what's wrong.

And for the "Sources" it's just a "Pass". I think is not good. So, I will have a long way to go in this part.

And the "Cohesion" and "Grammar" is higher than other parts. I'm very happy and I, I didn't think I have a higher score in this part, ...because I always think my grammar is poor, is not good. So, in this essay… I have a higher score in this part. I'm very happy. And thanks my tutor... give me my confidence for my grammar in the future, but I will improve it.

These useful rubric-prompted reflections are not an element of the online aspect, however.

In the final interview, S3 indicated that the rubric had become a tool for self-guidance, explaining how she used it after writing the draft to compare the criteria to what she had written and make changes accordingly. Here she displayed deep, rubric-influenced metacognitive growth similar to her overall feedback literacy development outlined above: firstly, the rubric positively influenced her self-knowledge as she used it to help identify areas of weakness to improve, and to motivate her rewriting processes; secondly, the rubric led to advances in her procedural knowledge of strategies to improve her academic writing as she had to explore various approaches to improve on the criterion she found most difficult, "Grammar". Notably in all these developments, the rubric she used was not the rubric in the online feedback platform as this was viewable only within the platform on submitted work, and additionally printing it out in attempts to bring it into her preferred learning environment produced a multi-page list rather than the onscreen tabular format expected. Just as with S1, S3 understandably found the incredibly lengthy printed list "not easy" to deal with, going so far as to politely suggest in the interview, "if it's okay, I want the rubric can be print." Furthermore, she was unable to use her established approach of seeking out peer feedback when it came to the previously received rubric feedback as the platform barriers prevented it: she noted she wanted functionality wherein "the rubric can add or share links with others" but that this wasn't possible. These online barriers meant that the rubric she used was the accessible, static Word version from the VLE which she could easily download for use on her computer and print for use offline.

The barriers to online rubric use did not prevent her metacognitive growth, however, and by the end she showed an excellent metaphorical understanding of the difference between the personable, directly focused feedback in the tutor comments versus the more impersonal, broader feedback of the rubric:

I think the comment is just some my tutor's views for my essay. I think his opinion is to get me to write a better essay and the rubric is more detail to teach you how to do this. The tutor is just a guide, guiding; the rubric is the way.

This metaphor seems to us an eloquent proof of the metacognitive growth possible through rubric use, yet clearly in this case this growth was due to every element of rubrics except their onlineness.

S4 CASE STUDY: LIMITED RUBRIC USE WITH METACOGNITIVE GROWTH IN A DIFFERENT ONLINE SPACE

S4 was a lively and enthusiastic student, with a well-developed feedback literacy from the start. She appreciated feedback and recognised its developmental impact beyond assessment and grading: "The grade is not everything. What's important is about the detail; it's the feedback itself". This student was also eager to enhance her contextual understanding of different feedback practices, which was reflected in her recording additional think-aloud screencasts, beyond the basic requests we made for the study. More online and procedurally oriented than S1, S4 created her own Personal Learning Environment (Haworth, 2016) in OneNote, where she engaged with feedback in dynamic, flexible and student-centred fashion, and which helped address her specific learning needs. Despite her advanced feedback literacy and metacognitive growth, S4's use of online rubrics was limited, even though she was well-aware of them and was keen to make the most of their learning potential. Thus, her non-use of the institutional online rubrics and preference for an alternative feedback space were perhaps indicative of not only "what was not there" but also of "what could have been".

From her first think-aloud, S4 demonstrated good metacognitive understanding of the factors that can positively impact her motivation and learning – in her case the affective dimensions of feedback (see Hyland, 1998; Pekrun *et al.,* 2002; Pitt and Norton, 2017; Yang and Carless, 2013): "[*Tutor's name*] is really good at encouraging us … whenever I saw all this kind of praise…, I really feel proud of myself and to establish my confidence in writing or in learning English".

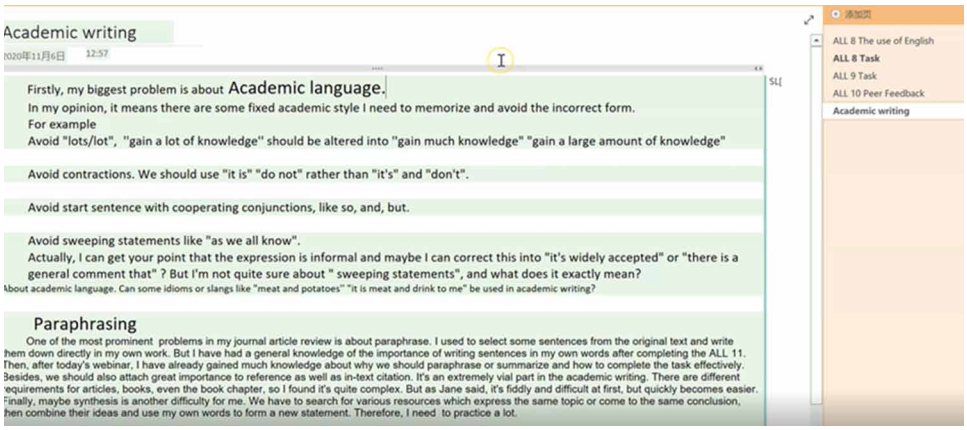
Her awareness of what feedback and learning strategies might work for her was often situated within the wider context of the feedback practices at this educational institution. While appreciative of her tutor's sense of responsibility and commitment to teaching, the student also showed awareness that this approach might be qualitatively different from the one during her future MA studies, which in turn increased her motivation to make the most of any feedback opportunities:

My tutor… takes her responsibility to fulfil the feedback. It's very, very detailed. I really appreciate it. So, it gives me a general knowledge of what I should keep, some of my merits, and what should I avoid, some of the mistakes… Maybe in the future… in my master's course, my tutor can't check so carefully... grammatical mistakes or vocabulary mistakes. Maybe he or she pays more attention on the topic or the direction of my dissertation. So, before that time, I need to consolidate my essential skills in writing assessments.

Importantly then, developing the right learning strategies was something that S4 sought from very early on. In response to her tutor's initial feedback on a short task and the challenges identified therein, e.g., academic language, paraphrasing and referencing, S4 adopted strategies that were deliberate and dynamic compared to the somewhat more generic and non-transferable procedural knowledge demon-

strated by other participants in the early stages of their metacognitive journey. S4 created a checklist of her strengths and weaknesses in OneNote, where she would record tutor feedback, her own examples of relevant language and discourse features, as well as personal reflections on the tutor comments and her learning (see *Figure 5*):

Figure 5. S4's feedback portfolio in OneNote



In her screencast think-aloud, S4 elaborated on her choice of OneNote, which has facilitated her metacognitive growth in all dimensions – of self, context and self-regulation. It enabled her to organise the feedback in a way that made sense to her learning, to add her own reflections, and thus actively process tutor advice, to insert URLs to external resources providing insight into S4's new academic context:

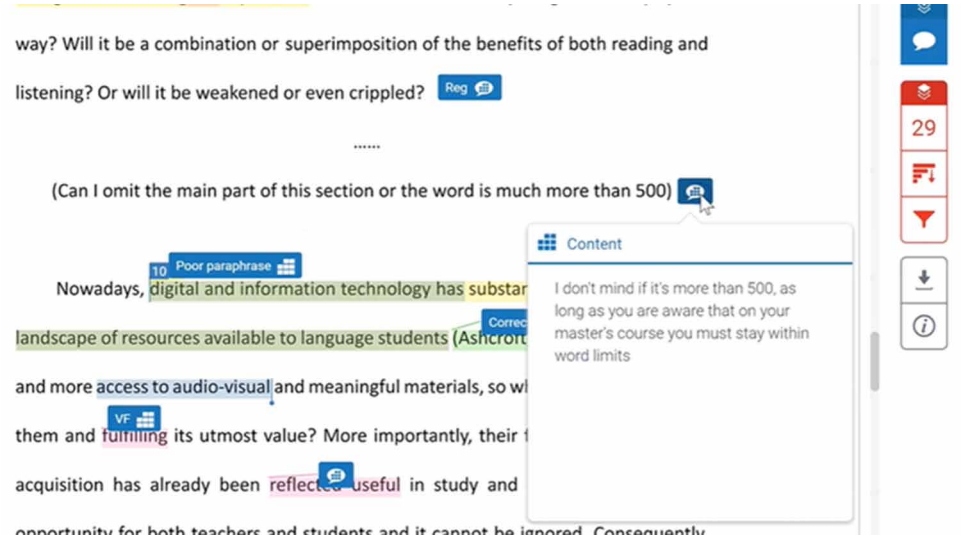
So, when I research... all the problems in my article, I make a checklist here. This is my OneNote. … This tool is really useful and appropriate for me 'coz it can meet all my demands in learning... Like this: Week 1, Week 2, and in Week 3… I summarised some of my problems here and in order to avoid the same mistakes next time. So firstly, it's about my academic language. It's the first time I exposure the academic style, so it's really useful. For example, I need to avoid "lots" or "lot", so it should be altered into "much" or "a large amount of" … So, after this, I summarised some tips. For example, I can understand the original work deeply and thoroughly, and then I can write down this opinions or ideas by my own words. And lastly, about my references here; it has so many requirements for different kinds of, you know, like books, book chapters and even articles. So, [tutor's name] provide this website to me and I found this extremely useful.

In addition to these affordances of a OneNote portfolio, in her follow-up interview S4 commented on the platform's metacognitive benefits for noticing patterns in errors: "it's organised by myself... the same mistakes appeared many times in my one assessment, so I can conclude them together and give each problem a subtitle … and then I can make such a checklist". Even though at this point S4 did not refer to the institutional online feedback platform, which is much more tutor-led and monologic (Robbins and Marinkova, in press), her choice of an alternative suggests that she, similar to S1's move to a paper-based folder enabling cross-task synthesis of feedback, was after an online "productive space"

(Bearman and Ajjawi, 2021) that could meet her specific learning needs and allow for her own active understanding of feedback practices to emerge.

S4's attempt to navigate the limitations of her online academic context to feedback as a student-led and dialogic practice (Bloxham and Campbell, 2010; Nicol and Macfarlane-Dick, 2006; Yang and Carless, 2013), was also evident in her pro-active stance seeking feedback. When submitting her formative assignment, she initiated a discussion with her tutor and added in her Word document a request for more targeted feedback (see *Figure6*), to which the tutor replied by using the in-text comment facility. S4's request in this instance both made use of **and** challenged the rather monologic functionalities of the institutional feedback platform, which are intended for delivering an old-paradigm type of feedback, or "feedback as information" (Winstone and Carless, 2022). Instead, S4's request ensured that the feedback she received made sense to her and was therefore accessible for uptake and enabled the adjustment of her learning strategies (Carless and Boud, 2018). S4's decision therefore not only shows her advanced metacognitive understanding of feedback as a dialogic process, but also her contextual knowledge of how feedback practices operate in this academic setting and her desire to shape the institutional feedback platform into a space that "can meet all [her] demands in learning".

Figure 6. S4's dialogic request for feedback in the institutional online feedback platform



Even though most of the above appears unrelated to S4's use of online rubrics, it provides an insight into some of the reasons why this non-use occurred. Similar to most participants, S4 did not make use of the online rubric in her first think-aloud, even though the feedback was rubric-referenced. Yet, in follow-up interviews, she reported awareness of the rubric: "I have noticed it and I click it on". S4 also commented with confidence on rubrics' role in helping her make sense of grades, "so I can check carefully about the kind of structure, vocabulary, references, what's the grade", and on their potential developmental impact in facilitating her understanding of academic expectations pre-submission and reflecting on own performance post-submission:

I need to look at it and research it carefully before the writing, not just before the feedback… because I need to be familiar with the criteria... And I need to know what level it is about my writing assessment and I can check which part I can improve.

In her final interview, S4 also elaborated on the way rubric score bands have helped her extend her understanding of UK grades, which are notoriously "polysemic ...signify[ing] different things to different students" (Sutton, 2012, p.34): "My final mark is 62. Actually, because it's my first- time encounter with the formal essay… I'm quite satisfied with this final grade… I checked the rubric, it belonged to the 'Merit', so I think it's OK". The rubric appeared to have had positive impact on S4's expectations and modulated the student's affective response to the grade – which is otherwise just a decontextualised number.

And yet, despite providing this additional context for S4, the online aspect seems to have prevented her from engaging with one of the learning opportunities of rubrics: that they break up an overall grade by showing achievement levels for each criterion. In her final interview, for instance, S4 literally enacted the missed encounters with these levels, opening the rubric but not scrolling enough to see that they had been highlighted. The cluttered layout prevented S4 from seeing the various achievement levels, and it was the interviewer who showed S4 how to find them - a moment in the interview that became a metacognitive experience:

Interviewer: *So, when you click here, where it says, "View rubric".*
Yes, I found it.
Interviewer: *And you should see a table with criteria...*
Yeah.
Interviewer: *OK. And you see on the left-hand side, you should see the criteria.*
Yes.
Interviewer: *And is there something about references? One of the criteria should be "Sources" ... or "Support". And then if you look on the right-hand side, you will see the tutor probably has clicked one of them squares that describes the level; it could be "Merit" or "Distinction" but for each criterion you'll be given a level...*
Yes, let me try. Here it is.
Interviewer: *So, see on the left-hand side you have "Sources", yeah? So, if you now use the glide and go further to the right. You know, this glide at the bottom of the page? Keep going. There we go. Oops, you missed it... A bit more to the left. There we go; so, you see the blue [square]? So, for "Sources" you were in the area of 62.*
OK, I got it. I didn't know that before … So, total score is a combination of these sections, right?

This somewhat laborious process of finding the highlighted achievement levels shows what might have prevented S4 from developing further her metacognitive contextual knowledge of online rubrics and grading systems in the UK, and even her monitoring skills. Not unlike participants S1 and S3, S4 shared that the static rubric had been useful and accessible. And, even though S4 repeatedly declared awareness of the online rubric and was willing to learn from the interviewer how to make the most of it, she regretted its "invisible" online aspects: "I didn't notice that before; that's a pity."

Paradoxically, then, in S4's case, it was the onlineness of the rubrics that failed to advance her metacognitive knowledge of her academic context. As a pro-active student who appreciated feedback and

was keen to develop her assessment and feedback literacy, S4 seemed to have found the combination of a static rubric and an alternative learning environment sufficiently accessible, interactive and dialogic. Aware of the online rubric, S4's use of it was limited to seeing it as a static list of criteria to adhere to and a useful code for unpacking the meaning of a numeric grade. She never made use, and thus, sense of the individual score levels within the online rubric, which make up a grade, or noticed its hyperlinking functionalities. By her own admission, the online rubrics could have potentially had more impact on her metacognitive understanding of UK grading practices and her self-regulation, had they been easier to access and navigate. However, when it comes to the kind of dialogic and affective feedback that S4 appreciated, and the student-centred learning environment that she found most productive, it is doubtful that the current online feedback platform could have met her cognitive and metacognitive needs.

S5 CASE STUDY: CONFIDENT RUBRIC USE WITH METACOGNITIVE GROWTH

S5 was a thoughtful and observant student, who continued to do a PhD after the completion of his MSc. He was committed to the project, enthusiastically taking part in a range of dissemination events. S5 was the participant who made the most of the interactive functionalities of the online rubric, using hyperlinks to make sense of feedback and engaging holistically with all elements of the online feedback space. In his metacognitive journey, S5 was supported by the online rubrics into developing a better sense of feedback practices in the UK and a more balanced sense of himself as a learner. His extensive, integrated and attentive use of the online rubric, though, also led him to conclude that a decontextualised online rubric is insufficient for meaningful self-monitoring and effective learning strategies.

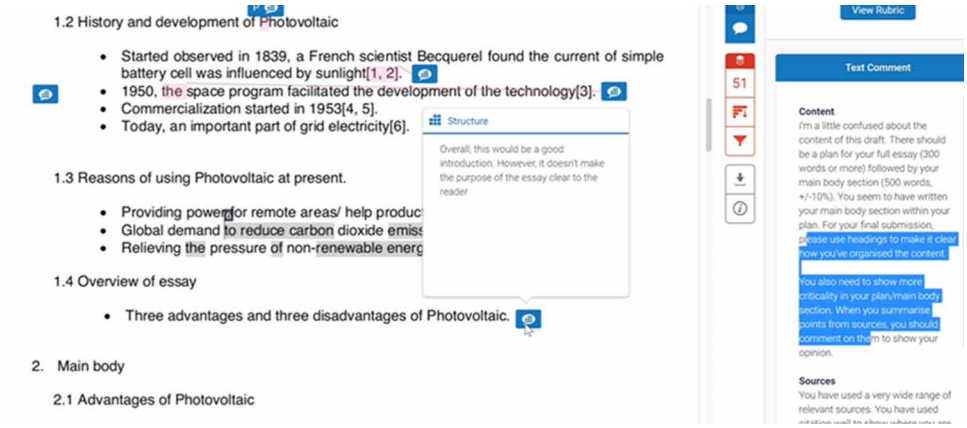
S5 approached the understanding of his learner self with a methodical mindset from the very start, although he tended to draw on a deficit framework, a prism through which EAP students are often viewed (Benesch, 2001), saying for example, "my biggest problem about my content is that I showed very little critical thinking". At the same time, he gave considered analysis of the strategies that he might deploy to address the identified deficit, and was able to articulate these in relation to his own context rather than generically, which tended to be the approach of other students:

I think in my future work, when I make some notes, I should give more my own idea… I had read a lot in our classes; it's all about my major. But I just… copied information from other sources... If I'm not critical thinking about it, they're just information, not my knowledge. So… if I want to get some skills in my future work, I have to do some critical thinking process… Such as when I'm reading one paper, in the past, I just think the researcher said very good and always right; but now I will think if I did this work, what method I would choose, and the results would have been better or not compared with this author.

This pronounced procedural orientation was accompanied by a significant degree of confidence when S5 encountered tutor feedback. In contrast to other participants, in his first screencast think-aloud, S5 summarised and sequenced his tutor's overall comments in an order that made sense to him as a learner, instead of reading them verbatim or in a linear fashion. This was particularly evident in his integrated approach to the online feedback space, where he would explicitly draw links between his tutor's overall and in-text comments: "after I read the right window information, I would immediately think of my writing structure in my essay… then, I will go to the left window and… find the details they give me". In his first screencast, S5 highlighted sections of the overall comment in the right-hand window, whilst

summarising the key messages in his own words and then moving to relevant illustrations of the point in his script on the left (see *Figure 7*). S5's approach therefore contrasted with the practices of S1, S2, and S3, who tended to engage with the different elements of online feedback in isolation and sequentially.

Figure 7. S5's integrated use of the online feedback space



This was sustained when S5 reviewed in-text comments on his script. He not only identified a specific example of a challenge highlighted in the tutor's overall comment, e.g., "lack of clarity", but then proceeded to expand on a related in-text comment by drawing on his subject domain knowledge and his pre-sessional context:

And there are also some details… that giving more unclear information. For example, in the introduction part, I wrote "In 1950 the Space program facilitated the development of the technology." My tutor asked me "Which space program?" because there are various program in different countries. And this question also remind me of the past class with [tutor's name]; she said, "When you write your article, you should make sure your work clear and logical." In other words, the reader of my work shouldn't need to infer my ideas.

Given that in the institutional feedback platform it is not possible for the tutor's overall comments to be hyperlinked to individual in-text comments, unlike the latter being hyperlinked to the online rubric criteria, the think-aloud also demonstrates S5's assured cognitive and metacognitive understanding of feedback comments and academic literacies.

S5's integrated approach to feedback was also evident in his online rubric use. Even though the participant did not make use of the rubric in his first screencast think-aloud, in the follow-up interview it became clear that he was aware of the tool and understood it as codifying performance standards: "My tutor give us one form about the rubric in the beginning of our course… She said we should follow these rubric criteria in future". And yet, unlike participant S4 who had made similar assertions but did not use the online rubric to its full potential, S5 showed fairly in-depth understanding of how the interactive functionalities of the online rubric facilitated his in-task synthesis of multiple feedback elements:

[Y]ou can see in my assignment draft, there a lot of [in-text comments]; so, you know, it looked very complex at first. But after I go to the rubric, I found that there are only four or five information because some information can be classified into the same topic, such as "Structure" ...And that rubric table me get a better understanding my tutor's advice… If I just... read [in-text comments] in my draft, I really didn't know which one… I should have read first and read next because, you know, it's so complex and so difficult.

S5's encounter with the sheer number and complexity of in-text comments shows the additional cognitive load associated with excessive quantity of feedback, which might even result in confusion or poorer performance (Hattie and Timperley, 2007). And in S5's case, the tabular format and hyperlinking functionality of online rubrics facilitated the processing of feedback in a way that made sense to this procedurally oriented student. What can also be seen in S5's second screencast is that his reliance on online rubrics to help him decode the in-text comments determined his navigation of the online feedback space: whereas other participants would first look at the tutor overall comment or in-text comments and end with the online rubric, S5 would use the online rubric earlier to organise his understanding of the in-text comments and refer to the tutor overall comment as a conclusion to his feedback reflection in the think-aloud.

Even though the online rubric supported S5's categorisation of in-text comments and their mapping onto assessment criteria, the inevitable "fuzziness" (Sadler, 1989) of the latter presented a barrier for his further use of this tool for self-regulation. S5 was unsure about the identical wording of rubric descriptors within the same score level: "I have some problem about the scores for 68 and 65 because their details are same with each other. So which type of writing belong to 68?", as well as the nebulous language of the descriptors of the top Distinction level: "Besides how to understand... the word 'highly' at 70?". The metacognitive experience of confusion about the meaning of rubric descriptors speaks to recurrent challenges in the articulation (by teachers) and internalisation (by students) of tacit knowledge within assessment criteria in general (O'Donovan *et al*., 2004; Orsmond *et al.,* 2002; Popham, 1997). Whilst not necessarily specific to online rubrics, the lack of clarity in the descriptors prompted S5 to consider the role of context in facilitating his cognitive processing of criteria:

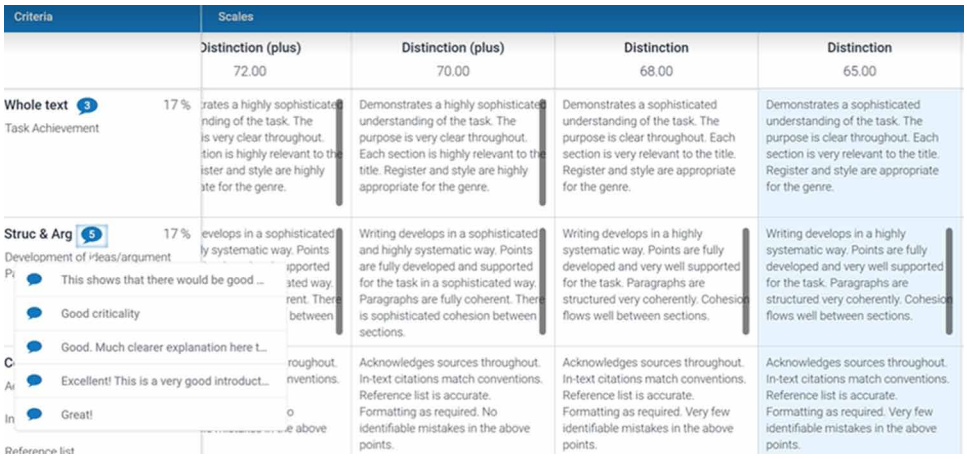
But I think there's a problem, you know. If you can give us more examples… about this rubric… I didn't know what's the really meaning of it. I can get a better understanding of it so, if you give me one or two examples about this criteria.

S5's request for "more examples" (i.e., exemplars of student work at different performance levels) suggests that it is not more transparency (see Bearman and Ajjawi, 2021), or granularity (see O'Donovan *et al.,* 2004) in the articulation of rubric criteria that was necessary. Rather, what could have advanced his understanding of rubrics and support his self-regulatory processes was more context and extensive engagement with a range of exemplars as also confirmed in rubric literature (Orsmond *et al*., 2002; Sadler, 2009).

An interesting metacognitive development in S5's use of online rubrics was the role they had in the adjustment of his understanding of his learner self. In his second think-aloud, S5 noticed that there was no straightforward correlation between the number of in-text comments hyperlinked to a specific criterion and the corresponding achievement level. He noted that the number of in-text comments that appeared in a drop-down box over the "Structure and argument" criterion (5), for instance, exceeded the number of

in-text comments associated with the "Cohesion" criterion (2) (see *Figure 8*), but this did not translate into a lower grade for "Structure and argument": "My tutor give me more details [*in-text comments*] at 'Structure and argument'; but most of these are good thing in my task… But my 'Cohesion' part had more problem". S5's observation that most of the in-text comments "are good" challenged the deficit framework through which he tended to interpret his learner self initially; and in the final interview, this self-knowledge shifted to a more balanced profile – a shift potentially signalled by the rubric itself: "I found most of my skills were good in this rubric".

Figure 8. S5's online rubric with five hyperlinked in-text comments for "Structure and Argument" visible in a drop-down box



Despite its potentially positive impact on S5's self-knowledge, the online rubric had a less clear role in enhancing S5's procedural knowledge. For him, what was missing from the online rubric was the context of the full student script and the guidance of the tutor – perhaps not dissimilar to his earlier request for more contextually relevant exemplars:

I have found grading about my skills in this place [the online rubric]. And the first that I did whether my skill is good or not good. And ...I found most of my skills were good in this rubric. But the next step is how to correct these problems and make more improvement. So, I find more details in the next here marks, you know, but I couldn't find the answer over here [the online rubric] …I think the network [hyperlinking] is useful for me because I know clearly which part had more feedback…, but the details on one sentence I think I can't understand them because as I'm reading the sentence I think I need to back to the contents [the script]… I think the overview comments in the [right] window is very important to me because after reading every sentence I find the details in the left window, not in the rubric part.

For S5 then, the online rubric had a role to play in building a balanced view of himself as a learner, a deeper understanding of the UK academic context, and a starting point for his self-regulation. However, in terms of developing appropriate and effective learning strategies, S5 discovered that he "couldn't find the answer" in a rubric space, albeit with hyperlinked in-text comments. His use of the online ru-

bric showed that it was a "productive space" for summative purposes post-submission as it enabled the integration of different online feedback spaces, but this was lacking for developmental purposes due to its insufficient context.

CONCLUSION

Our findings build a complex picture of the range of metacognitive experiences triggered by online rubric use. Being able to see how online rubrics, and the broader online feedback journey of which they are part, are experienced from five different students' perspectives is we feel an inherently valuable step in helping educators understand the challenges and the possibilities for students in this environment. While it is not the purpose of a case study approach to deduce generalizable truths, these five cases do share overlapping elements that can move us to a better understanding of online rubrics' impact on metacognition. The most obvious to note is that of the five cases, only one (S5) was able to engage with the online rubric well, and to exploit the way the in-text comments were hyperlinked to rubric criteria to further develop his already quite high-level metacognition. The other students were hampered in one way or another by the barriers of the online rubrics, for example: they did not initially see how to access them (S2, S3); once accessed, they did not always see the full rubric (S3, S4); and there was no way to engage holistically with the rubric feedback along with the other feedback and feedback from other tasks, requiring students to create their own compiled feedback spaces (S1, S4). From a digital perspective, the separate and work-obscuring way the rubric had to be viewed, combined with it being non-printable, non-shareable, accessible only post-submission, and in a one-way rather than dialogic communication space meant that ultimately the "online-ness" prevented metacognitive development.

However, the students were able to largely overcome these barriers, albeit noting experiences of confusion and frustration with the online rubric, and took differing metacognitive journeys over time to make rubrics work for them. As most of our participants started with an already well-developed metacognitive base, most of them sought to build on the self and contextual knowledge they already had by using print or static electronic rubrics to, for example, develop awareness of tutor expectations and task requirements, use criteria for strategy prioritization, and reflect and self-evaluate. Most participants' encounters with online rubrics prompted reflections on online rubrics' potential to support further the monitoring of learning (e.g., through cross-task feedback records or interactive portfolio) and evaluation of own progress (e.g., through interactive self-assessment activities, peer feedback sharing). Some encounters with the online affordances of rubrics resulted in recognition of their ability to synthesise different levels of external feedback and directed learners to a more in-depth exploration of their contextual knowledge, particularly criteria, grading systems, and feedback. In particular, for S1 and S5, the limitations of online rubrics (inability to see all at once, decontextualised hyperlinked comments) paradoxically prompted further metacognitive development than would have otherwise been. And, with the exception of S2, who developed a minimal rubric use over time that was simply grade and performance-level focused, all the participants developed an understanding and appreciation how rubrics overall (not just online) could help them develop as autonomous learners: as S3 stated in her final interview, "the tutor is the guide; the rubric is the way".

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