How Student Involvement in Rubric Formulation Correlates With Feedback-Seeking Behaviour

Celine Giepmans

6260144

Master Thesis Educational Sciences

Faculty of Social Sciences

Utrecht University

Supervisor: Casper Hulshof

Second assessor: Jeroen Janssen

5 December, 2022

5789 words (excluding reference list and abstract)

Abstract

This study investigated how the involvement of students in rubric criteria formation and other rubric-related metacognitive activities may increase feedback-seeking behaviour. Rubrics are helpful assessment tools, but without supportive classroom activities, they may not lead to self-regulating behaviour in students that allows for increased performance. Considering the self-determination theory, one can conclude that allowing students to contribute to the rubric formation may solve this issue. The current study has tested whether such involvement correlates with higher levels of autonomous motivation and feedback-seeking behaviour. This was done by the means of a survey asking after the students' input in rubric criteria; whether they partook in other metacognitive activities relating to the rubric; their autonomous motivation; their display of feedback-seeking behaviour; and several control variables. Participants were students at Dutch colleges and universities. Correlation analyses and t-tests were used to determine the significance of these correlations. The findings reveal that metacognitive activities correlate with higher levels of feedback seeking, although no relationships could be found involving rubric input or autonomous motivation. The absence of these results are mostly ascribed to the limitations of the present study.

Keywords: rubrics, student involvement, assessment, feedback-seeking behaviour, motivation, self-determination theory

How Student Involvement in Rubric Formulation Correlates With Feedback-Seeking Behaviour

Rubrics are tools that are often used in educational assessment. They can be defined as documents that list criteria, manner of scoring, and gradations of quality (Reddy & Andrade, 2010). More so than many other methods of assessment, rubrics may be beneficial for learning and performance (Panadero & Jonsson, 2013; Andrade, Du, & Wang, 2008). It appears that rubrics by themselves are not sufficient to improve student performance, however. Looking for methods to alleviate this, Fraile et al. have researched the effect that the co-creation of rubric criteria may have on student self-regulation and performance (2017). Using their research as a starting point, this paper considers how the helpful effect of rubrics on learning can be enhanced through student involvement and its subsequential effects.

Potential of Rubrics for Self-Regulating Activities

Panadero and Jonsson found in their review of research on rubrics many positive effects. There were multiple ways in which the use of rubrics mediated improvement in student performance, including increasing transparency and aiding student self-regulation (Panadero & Jonsson, 2013). They found this reflected in the studies done by amongst others Andrade & Du (2005), and Reynolds-Keefer (2010), as students remarked on the frustration they otherwise felt over the obscurity of assessment criteria. Adding a quantitative perspective, Schamber and Mahoney (2006) and Andrade (2001) revealed that students were better able to identify subsequently the assessment criteria and teachers' expectations when using rubrics. Indeed, rubrics may grant both students and teachers clarification regarding the assessment criteria and scoring strategy (Andrade, 2005). This clarity may also increase the objectivity of assessment and consistency across different assessors (Peat, 2006). Moreover, filled in rubrics may provide students with feedback, as the scoring on the different elements of the assignment provides insight in strengths and weaknesses (Reddy & Andrade, 2010).

These qualities have made rubrics suitable for self-regulating activities as well as formative assessment, especially in the form of self-assessment. Such occupation with goals, planning and evaluation of their own learning process likely enhances self-regulated learning and feeling of competence and self-efficacy among students (Panadero & Jonsson, 2013; Fraile et al., 2017). Multiple studies from Panadero and Jonsson's review showed students using rubrics as an aid in the planning and development of their assignments (Panadero, 2011; Andrade & Du, 2005; Reynolds-Keefer, 2010). Some conducted studies also give reason to believe that students use rubrics to self-assess and reflect on their work out of their own volition (Andrade & Du, 2005; Reynolds-Keefer, 2010).

Metacognitive Activities

Nevertheless, the majority of the studies in their review combined the use of rubrics with some form of metacognitive activity, such as organised self-assessment (Panadero & Jonsson, 2013). Without such additional intervention, active and fruitful interaction with rubrics does not seem to be guaranteed. This makes finding appropriate activities of this kind crucial for the optimisation of learning with the aid of rubrics. There is much research that focuses on the involvement of students when constructing assessment criteria (Tillema, 2014; Bloxham & West, 2007; Leenknecht & Prins, 2018; Fraile et al., 2017). Fraile et al. proposed the co-creation of rubrics as a method to enhance learning potential (2017). According to the self-determination theory, involving students in the creation of rubric criteria may indeed be effective.

Self-Determination Theory (SDT)

SDT describes different types of motivation ranging from controlled to autonomous (Ryan & Deci, 2017). Overall, autonomous motivation is deemed the most effective kind. Moreover, influence of social-contextual factors, such as classroom situations, has a central place within this theory. These factors can be supportive or frustrating to the three basic

psychological needs it describes: competence; relatedness; and autonomy. When these needs are thwarted, well-being and learning can be undermined (Ryan & Deci). This also goes for the effective use of rubric criteria. Indeed, Leenknecht et al. found that the fulfilment of the psychological basic needs lead to higher levels of student performance, as mediated by autonomous motivation (2021).

Competence

The first need refers to the feeling of being capable of performing the task at hand (Ryan & Deci, 2017). Therefore, the task should be clear, of appropriate difficulty, and feedback should be constructive. Rubrics offer opportunity for such clarity and a framework for helpful feedback. Despite this, students are still likely to interpret the criteria differently, leading to confusion over the assessment (Gibbs, 2010). Even when described in great detail, criteria are difficult to transfer. Such lack of clarity would make it impossible for students to assess their attainment, thwarting the their feeling of competence to handle the problem.

Classroom practices in which students gain insight in the way teachers view and mark a range of work, can discuss the quality of this work with each other, and can align their judgements together allow for students to successfully internalise criteria (Gibbs, 2010). Defining assessment criteria cooperatively with students can help clarify these criteria for them (Tillema et al., 2011; Falchikov, 2004). Leenknecht and Prins found positive effects of student co-creation of rubrics on their understanding of the assessment criteria and performance (2018). Their study concerned primary school students who created a list of assessment criteria in discussion with each other and the teacher.

Relatedness

Then, relatedness is tied to feeling connected to the rest of the students and the teacher. Students should feel like part of the group, in which their contribution is valued and questions

can be asked (Ryan & Deci, 2017). Involving students in the synthesis of assessment criteria could therefore enhance their feeling of relatedness.

Autonomy

Finally, the need of autonomy is met when behaviour of students is self-motivated and in line with their own values and thoughts, making it not just the product of external demands. Ryan & Deci found that autonomy is a precedent of feelings of competence as well as relatedness (2017), making autonomy support the most vital of the three. Here, it is important to consider that great clarity of assessment may lead to instrumentalism among students (Torrance, 2007). They may use the rubrics in particular as a superficial checklist, rather than a tool for reflection (Andrade & Du, 2005; Reynolds-Keefer, 2010). This creates a problem for feelings of autonomy, as students need to feel like the owners of their own learning process rather than followers of assessment criteria.

Autonomy support emerges from the realisation that students are autonomous beings and that teachers should help them learn with as much autonomy as possible (Ryan & Deci). One way of acknowledging the value of students' sovereignty is by taking their feedback on the course that is taught. Allowing students to adjust and refine the rubric criteria in a class discussion with the teacher may be another way of providing such autonomy support, as this would be a form of incorporating the students' feedback. In the case of rubrics, Fraile et al. and others have theorised that involving student in the negation of criteria enhances their autonomy (2017; Andrade & Valtcheva, 2009; Panadero & Romero, 2014). So, both the issue of a lack of clarity and that of a lack of autonomy can be addressed by involving students in the formulation of rubric criteria.

Student Involvement and Motivation

When students have input in the creation of rubrics, it may support all three of the basic needs. This in turn would lead to increased autonomous motivation. Leenknecht et al.

found that formative assessment – which the co-creation of rubrics would be a variation of – increases students' autonomous motivation (2021). This supports the theory of Fraile et al. that involvement of students in the formulation of rubric criteria stimulates self-regulation (2017), as autonomous motivation is a prerequisite of such behaviour (Beenen, Pichler and Levy, 2017). To further explain the merit of such increased motivation, feedback-seeking behaviour should be considered.

Autonomous Motivation and Feedback-Seeking Behaviour

One of the most important influences on student performance is feedback (Gibbs, 2010), a reason teachers may want to encourage students to look for it actively themselves. This makes feedback-seeking behaviour an especially interesting self-regulation phenomenon in learning research. Self-regulation concerns the monitoring and evaluation of one's thoughts, methods, and progress, and adjusting one's behaviour accordingly. Self-regulation fits in the framework of SDT, as such actions are per definition motivated and guided by autonomous motives (Legault & Inzlicht, 2013). Therefore, SDT deems autonomous motivation essential for feedback seeking. Several studies have found that levels of perceived autonomy support have a positive influence on achievement via the employment of self-regulating behaviour (Black & Deci, 2000; Beenen et al., 2017). Beenen, Pichler and Levy found newcomers in an organisation to be more likely to seek feedback when they saw their supervisors as autonomy supportive. This result could possibly be applicable to students and their teachers as well, which would lead to better student performance.

Current Study: Student Involvement in Rubric Criteria Formulation

While writing an analytical review of studies concerning student involvement in assessment, Tillema found that these studies were lacking (2014). He addressed that students found fairness and transparency important, but the studies gave few clear guidelines for the provision of this. When his report was written, research was also lacking on the topics of

involving students in the formulation of criteria and assessments. This means that more research should be conducted surrounding the merits of student involvement in assessment.

Thereby, research regarding feedback-seeking behaviour in students is still limited. Much research on feedback-seeking behaviour focuses on workplace environments, supervisors and teams (Anseel et al., 2015; Crommelinck & Anseel, 2013). There is reason to believe that involving students in the creation of rubric criteria could enhance performance through increasing feedback-seeking behaviour. Fraile et al. found confirmation of their theory that co-creating leads to more self-regulation (2017), as measured through thinking aloud protocols, though this was not reflected in the self-regulation questionnaire. In addition, they did not test whether this was mediated by motivation. Henceforth, the phenomenon of students having some form of input in the creation of rubric criteria will be referred to as rubric input.

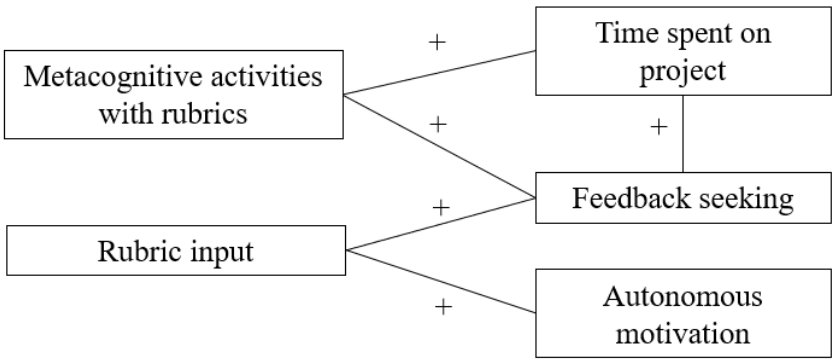
While previous studies indicate there is good reason to believe that rubric input could lead to the fulfilment of the basic needs, increased autonomous motivation and therefore could lead to feedback-seeking behaviour, this has not yet been tested. The confirmation of these potential effects could inform the formation of more motivating and effective assessment strategies. This gives rise to the research questions: (1) *To what extent does rubric input correlate with higher levels of feedback-seeking behaviour?* (2) *To what extent does rubric input correlate with higher levels of autonomous motivation?*

Many college and university courses may already employ various types of metacognitive activities. As similar benefits can be expected from such activities (Panadero & Jonsson, 2013), it would be wise to analyse the effect of other metacognitive activities on feedback seeking as well. This leads to the question: (3) *To what extent does the employment of metacognitive activities surrounding the rubrics correlate with feedback-seeking behaviour?* In addition, metacognitive activities may form encouraging factors to start the

project earlier. The more time a participant has spent on their project, the more chance of feedback seeking they may have had. Therefore, percentage of time spent on project is taken into account and analysed with the question: (4) *What relationships can be detected between time spent on the project; metacognitive activities; and feedback-seeking behaviour?* The hypothesised effects are displayed in Figure 1.

Figure 1

The Expected Correlations among Metacognitive Activities, Rubric Input, Autonomous Motivation, Feedback Seeking, and Time Spent On Project



Hypotheses

Based on the found literature, the following hypotheses have been constructed. (1) Students who were to some extent involved in the formulation of rubric criteria are expected to display more feedback-seeking behaviour, causing a positive correlation. (2) Rubric input is expected to positively correlate with autonomous motivation due to its anticipated support of the three basic needs. In addition, (3) the hypothesis is that students who participated in a metacognitive activity relating to the assessment criteria display more feedback-seeking behaviour, as they may have felt prompted to start working on their project earlier. Therefore, (4) positive correlations between rubric-related metacognitive activities, percentage of time spent on the project and feedback-seeking behaviour are expected.

Method

Research design

This research makes use of a survey design. This set-up was chosen because of its efficiency. Moreover, it would be least intrusive to participants' time and privacy.

Participants

A convenience sample was used, as participants were students at institutions that are contacts of the researcher. Only students who were following a course that made use of assessment rubrics were asked to participate. Forty-two (71.2%) participants came from the same course. This is a significant percentage, and should be taken into consideration when interpreting the results. This large percentage makes it possible that any found correlations are influenced by other factors that are specific to this one course, and not the presence of metacognitive activities. Furthermore, 56 participants, 94.9%, were studying at university rather than college. The aim was to find 100 participants in total with a 50% distribution between those with and without rubric input. This number was established by means of a statistical test for linear multiple regression in GPower. However, only 70 participants filled out the survey, of which 11 were removed before the main data analyses.

Measures

Rubric input

Participants were asked if they had had any input in the creation of the assessment rubrics at any point. This includes full co-creation; classroom discussions that could lead to revision of the rubrics; or opportunities to request revision or refinement of the rubrics within the present rendition of the course (see Appendix A). Feedback on the assessment materials that would only be incorporated for future renditions of the course were not considered rubric input, as it did not affect the students' own assessment. This divided the participants into two groups: those who had some form of input, and those who did not. Participants were also asked about and whether the course had organised other metacognitive activities surrounding

the rubrics, as this would have had similar effects as rubric input (Panadero & Jonsson, 2013). Moreover, they were asked when they were able to review the assessment rubrics; when they started the course; when they started working on their final projects; and how long the course lasted. These factors may have influenced how much time they had available for feedback seeking. Inquiring after these variables allows for further analyses regarding feedback seeking and autonomous motivation.

Autonomous motivation

The Self-Regulation– Academic questionnaire was used to measure the autonomous motivation of students. Contrary to what the name suggests, this survey measures the extent of self-determination within the motivation of students, rather than self-regulation. It was developed by Ryan and Connell (1989), and adjusted by Vansteenkiste et al. (2009) and Leenknecht et al. (2021) subsequently. In total, the questionnaire consists of 16 items which are answered using a 4-point Likert scale, ranging from *completely disagree* to *completely agree*. An example of an autonomous motivation item is "I am studying for this course because I want to know more about the topic" and of a controlled motivation item is "I am studying for this course because I am expected to." The autonomous scale scored ϖ = .961 and the controlled scale scored ϖ = .886 for reliability in Leenknecht et al.'s study.

With the use of RStudio version 4.1.2, the construct validity of the questionnaire was tested by the means of a confirmative factor analysis (CFA). Following guidelines by Browne and Cudeck (1992), the model's fit was evaluated by CFI (good > .95, acceptable >.90); TLI (good >.95, acceptable > .90); and RMSEA (good < 05 < acceptable < .10). In addition, the reliability of the questionnaire was determined by calculating Cronbach's alpha (acceptable >.6; Evers et al., 2009). Chi-square was not used, as the small sample size would make it insensitive to unfitting models (Kyriazos, 2018).

Reliability of the questionnaire was good (α = .65). However, the CFA for the motivation survey revealed a rather weak construct validity, *CFI* = .71, *TLI* = .66, *RMSEA* = .15. Adjustments were made to the survey items after further analyses. This consisted of the creation of scree plots to determine the correct number of factors, followed by EFA analyses to redistribute items amongst the variables and delete poor items. Direct oblimin rotation was applied, as the factor correlations exceeded .10 (Field, 2018). Then, reliability tests helped eliminate further items from the survey. For the scree plots, Kaisers criterion was used (eigenvalue >1; Yong & Pearce, 2013). Items were accredited to a factor if they loaded >.3 on a single factor, if they had an item-rest correlation of >.3 (Field, 2018, p. 798), and did not negatively affect the scale's Cronbach alpha. Factors had to consist of at least two items. After the removal of poor items, these analyses were run again. This resulted in a two-factor model (α = .83) which consist of the factors "intrinsic" (R^2 = .94, α = .87) and "conscience" (R^2 = .81, *SB* = .77). The resulting motivation survey was sufficient according to the previously mentioned guidelines, *CFI* = .98, *TLI* = .98, *RMSEA* = .06. Only the intrinsic factor was used in analyses, as this most closely resembled autonomous motivation. The full survey can be found in Appendix A and the adjusted item list can be found in Appendix B.

Feedback seeking

This was measured with the Feedback Seeking Scale (Leenknecht et al., 2019). The questionnaire consists of a scale for inquisitory feedback seeking (six items) and monitoring feedback seeking (five items). Examples of each scale are "How often did you ask your fellow students how best to carry out your task within the project?" and "How often have you paid attention to what the teacher says about your efforts in the project group?" respectively. The questions make use of a 6-point Likert scale, ranging from *never* to *always*. The questionnaire was originally created by Williams and Johnson (2000), based on work by Ashford (1986). Leenknecht et al. reported a reliability of sufficient to good, with Cronbach's

α = .97 for inquisitory and α = .77 for monitoring feedback seeking. Reliability of the questionnaire was good (α = .89). However, the CFA showed a suboptimal fit, *CFI* = .81, *TLI* = . 75, *RMSEA* = .15.

To amend the survey, the same steps were followed as with the motivation survey. This resulted in a two-factor model for the questionnaire (α = .84), consisting of the factors "inquisitory" (R^2 = .68, α = .82) and "monitoring" (R^2 = .86, α = .80; see Appendix B). Unfortunately, the feedback-seeking survey had only improved slightly in its construct validity, *CFI* = .88, *TLI* = .82, *RMSEA* = .15. The adjusted version of this questionnaire was still used in analysis, as its content validity was shown to be good by its previous employments (Leenknecht et al., 2019). Nevertheless, given its insufficient fit, this data should be interpreted with care (see Appendix A and B).

Descriptive Measures

Participants were asked if they are doing a university or college course and at what point in time they were given access to the rubrics. With these descriptive measures, the sample could be characterised. Additionally, questions about the metacognitive activities; courses' length; and weeks students spent on their project helped inform analyses controlling for the effect of these variables (see Appendix A). Data regarding involvement in metacognitive activities could be analysed dichotomously in case of low variation amongst the types of metacognitive activities reported. Data regarding the time students spent on their course and project was used to calculate the percentage of course time they spent on their project.

Procedure

The survey was conducted online with the use of Qualtrics. In total, the questionnaires took roughly 20 minutes. Participants read and signed an informed consent that allowed their data to be used in the research. They did this prior to starting the survey. The informed

consent page contained the details of the researcher, whom participants could contact if they had any further questions (see Appendix C). Participants were free to quit participation at any time, however, as Qualtrics gathered their data anonymously, they could not retract data that was already submitted. At the end of the survey they had a final option to request the removal of their data.

Analysis

The level of significance was set to be $\alpha = .05$. For the analysis of the results, SPSS version 28 was used. First, all variables of interest were compared by the means of correlation analyses. Then, assumptions were checked using multiple regression analysis. With the use of t-tests, it was calculated whether participants that were involved in the rubric formulation or other metacognitive activities differed significantly on motivation and feedback seeking from students who did not have this opportunity. If there was no relationship between a variable and feedback-seeking behaviour found at all, the analyses for the inquisitory and monitoring variant were not reported.

Assumptions

Assumptions of linearity, homoscedasticity, normality, and the lack of outliers were checked by means of visual inspection of a scatterplot and a Normal Probability Plot. Moreover, outliers could be detected after calculating standardised residuals and Mahalanobis distance, which for two independent variables should not exceed 13.82 (Tabachnick & Fidell, 2007 as cited by Pallant, 2011). Correlations as well as tolerance and variance inflation factor statistics served to indicate multicollinearity, which can be defined as an unusual high correlation between predictors. When the tolerance was greater than .1 and the VIF was smaller than 10, this assumption was deemed fulfilled.

Results

Descriptives

Prior to analysis, the data of 1 participant was removed as they had withdrawn from the data collection. The percentage of course weeks the participants spent working on their final project (henceforth percentage of time spent on project) was calculated (see Appendix D), as this variable is likely to influence how much feedback participants were able to seek. The data of another 11 participants had to be excluded, as the times they indicated for the start of the course, project and length of the course did not add up. This data was deemed unusable, as their percentage of time spent on project could not be calculated and controlled for.

In total 49 participants (83.1%) did not feel involved in the rubric criteria formulation at all. In the sample, 38 participants (64.4%) were able to access the rubric from the start of the course onwards. Another 10 (16.9%) were able to do so in the first few weeks. Only 3 participants (5.1%) barely had been able to review the rubric before the deadline of the assignment and 8 participants (13.6%) had not seen the rubric yet at the time of filling out het survey. The incorporation of metacognitive activities in course activities was analysed as a dichotomous variable, given the lack of variation of different metacognitive activities employed in the courses. Of all participants, 24 (40.7%) attended a course that included such exercises to help process the assessment rubrics, including discussing the criteria or practicing self-assessment.

Remarks

A number of remarks were left at the end of the survey (see Appendix E). Most of them pointed out possible unsuitability of items in the feedback-seeking survey. These students worked independently, had little guidance, did not participate in a group project with group members and therefore had to be creative in their interpretation of items mentioning these concepts. Some of these remarks came from students of the course that 71.2% of the participants filled out the survey for, meaning the majority of participants may have struggled with unsuitable questionnaire items.

Results research questions

For the analysis of rubric input, feedback seeking and autonomous motivation, all assumptions were checked. All detected correlations are depicted in Figure 2. The first research question concerns the correlation between rubric input and higher levels of feedback-seeking behaviour. Feedback seeking and rubric input could not be established to be in correlation, $r_S(57) = -.035$, $p = .795$. Moreover, there was no significant difference found in scores on feedback seeking between courses with ($N = 10$, $M = .276$, $SD = .113$) and without some form of rubric input ($N = 49$, $M = .285$, $SD = .106$), $t(57) = .238$, $p = .813$, two-tailed. Cohen's d was .083, so the difference between groups was very small compared to the variability.

The second research question concerns the correlation between rubric input and higher levels of autonomous motivation. Such a correlation was not detected, $r_S(57) = -.090$, $p = .496$. Autonomous motivation also did not correlate significantly with any of the other variables (see Appendix F). There was no significant difference in scores of autonomous motivation between courses with ($N = 10$, M = .714, $SD = .220$) and without rubric input ($N = 49$, $M = .771$, $SD = .171$), t (57) = .912, $p = .366$, two-tailed. Cohen's d was .317, so the difference between groups was small to medium compared to the variability.

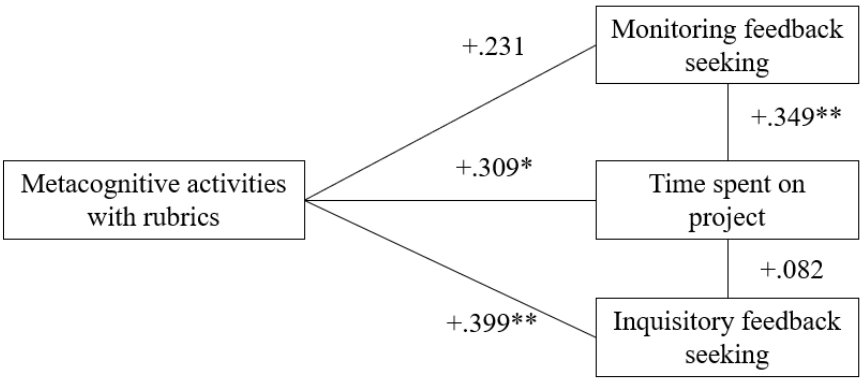
The third research question concerns the correlation between the employment of metacognitive activities and feedback-seeking behaviour. There was no significant correlation found for monitoring feedback seeking, meaning metacognitive activities are not related to higher levels of monitoring feedback-seeking behaviour. However, there was a significant correlation as well as difference in scores on inquisitory feedback seeking for courses with ($N = 24$, $M = .403$, $SD = .162$) and without metacognitive activities ($N = 35$, $M = .299$, $SD = .135$), t (57) = -.2678, $p = .01$, two-tailed. Cohen's d was -.710, so the difference between groups was large compared to the variability. The difference in scores in monitoring

feedback-seeking behaviour of courses with (N = 24, M = .575, SD = .193) and without metacognitive activities (N = 35, M = .467, SD = .195) was significant, $t(57) = -2.1$, $p = .04$, two-tailed.

The final research question concerns the correlations between time spent on project; metacognitive activities; and feedback-seeking behaviour. Time spent on the project correlates with the employment of metacognitive activities and monitoring feedback seeking, but not inquisitory feedback seeking. This means the incorporation of metacognitive activities in the course programme is related to the percentage of course weeks students spent on the project as well as to monitoring feedback seeking, which in turn correlate with each other. The difference in percentage of time spent on the project for courses with (N = 24, M = .659, SD = .349) and without metacognitive activities (N = 35, M = .402, SD = .304) was significant, $t(57) = -3.0$, $p = .004$, two-tailed. Cohen's d was -.795, so the difference between groups was large compared to the variability.

Figure 2

Correlations that Were Detected Among Metacognitive Activities, Percentage of Time Spent on Project, Monitoring Feedback Seeking and Inquisitory Feedback Seeking



Note. N = 59. *p < .05. **p < .01. ***p < .001 (2-tailed).

Discussion

This paper aimed to explore the questions: (1) “To what extent does rubric input correlate with higher levels of feedback-seeking behaviour?”; (2) “To what extent does rubric input correlate with higher levels of autonomous motivation?” Neither of these relationships was found, as the results showed that rubric input nor motivation correlated with other variables. However, for the other questions positive correlations were found: (3) “To what extent does the employment of metacognitive activities surrounding the rubrics correlate with feedback-seeking behaviour?”; (4) “What relationships can be detected between time spent on the project; metacognitive activities; and feedback-seeking behaviour?”

Research Questions

Metacognitive activities

This study provided confirmative results for the research questions regarding metacognitive activities. Metacognitive activities increase the likelihood of students utilising rubrics’ possibilities for self-regulating behaviour (Panadero & Jonsson, 2013), of which feedback-seeking is a valuable example. Indeed, analyses regarding metacognitive activities yielded a number of significant results (see Figure 2). It was found that metacognitive activities may lead to students spending more time on their projects – which correlated with more monitoring feedback-seeking – and make more use of inquisitory feedback strategies.

Percentage of time spent on project correlated with monitoring feedback seeking, but not inquisitory feedback seeking. This finding is interesting, as the expectation was that a higher percentage of time spent their on project would allow for more feedback seeking in general. A possible explanation is that the activities encourage students to start their project earlier, which allows for more monitoring feedback seeking, as this increases opportunities for spontaneous feedback from classmates. However, this early start does not automatically lead to further inquisitory feedback seeking. Alternatively, the number of participants and effect size may have been too small to detect the relationship between inquisitory feedback

seeking and percentage of time spent on project. It is important to note that many participants appeared to have filled in the information about their course length, start time and project start time incorrectly. These test items were either confusing or not suitable for the type of course they attended. Data of these participants was excluded from analysis, but it cannot be guaranteed that all other participants submitted correct data. Given these limitations, the analyses and conclusions regarding percentage of time spent on project should be interpreted with caution.

Rubric Input

Two research questions concerned the involvement of students in the formulation of criteria, which was theorised to fulfil their basic needs and correlate to higher levels of autonomous motivation and feedback seeking. The current study was not able to support this theory, which is likely ascribable to its limitations.

Autonomous motivation was measured through The Self-Regulation– Academic Questionnaire and Feedback Seeking Through Feedback Seeking Scale. Despite the previous uses of the questionnaires by Leenknecht et al. (2021) and Leenknecht et al. (2019), this study's CFAs indicated that the construct validity of both surveys were lacking. It was unclear whether a CFA had been performed for either survey in the previous studies. Moreover, it is possible that the feedback seeking survey was unsuitable to the participants of the current study. Many left remarks indicating that this questionnaire contained items that were not applicable to their situation, of which can be assumed that this applied for the majority of the participants. After the performance of EFAs, almost half of all items were cut and the feedback seeking survey still lacked in construct validity. Given the subjective nature of psychometric tools such as these questionnaires, it is possible that striving for high scores on construct validity does not improve the quality of the surveys (Borsboom et al., 2009). Indeed, for the motivation surveys, nearly only intrinsic motivation items remained after the EFAs.

Because of the possible unsuitability of the questionnaires as well as the drastic changes made to them, the results need to be carefully interpreted. Potentially, the results could have been different had the surveys not been altered.

Alternative explanations

The connections found between metacognitive activities; feedback seeking; and percentage of time spent on project give reason to believe that a similar interaction between rubric input – a form of a metacognitive activity – and feedback seeking could still be present. The fact that autonomous motivation did not correlate with any of the other variables was unexpected, as motivation tends to influence variables such as self-regulating behaviour and time spent on project (Legault & Inzlicht, 2013; Zimmerman, 2008; Rheinberg et al., 2000; Barak, 2010; Everaert et al., 2017). Moreover, it can be influenced by classroom practices (Jones et al., 2012; Ames, 1992). This study could not detect any mechanisms of SDT in this context, indicating that motivation is not always involved. Assuming motivation played no role in any of the detected correlations, metacognitive activities may simply provide students with practice in metacognitive approaches, making them more aware of the option to engage in feedback seeking. It also may help students understand the criteria and increase self-efficacy towards the project and encourage self-regulation in this manner (Bouffard-Bouchard et al., 1991; Fraile et al., 2017; Panadero & Jonsson, 2013). This self-efficacy may be too different from the basic need of competence (Rodgers et al., 2013), despite their similarities. This would mean it may not have the same relationship with autonomous motivation as the basic needs do. In these ways, metacognitive activities may boost feedback-seeking behaviour while not influencing motivation.

Alternatively, it is possible that no correlations with rubric input or autonomous motivation were detected due to the small sample as well as effect size for these analyses. Control variables did not offer further alternative explanations, as both the length of the

course and the moment that students were given the course rubrics did not significantly correlate with their scores on motivation or feedback seeking (see Appendix F).

Limitations

Overall, the main limitations of this study reside in the method. The surveys and questions may have not been sufficiently appropriate, meaning that especially the analyses concerning feedback seeking need to be interpreted with caution. In addition, the sample was rather small and unvaried in terms of the researched variables. Given the nature of the study, the types of courses and rubrics involved as well as the exact nature of the activities embedded could not be observed or controlled for. In addition, it is unclear to what extent the basic needs were met, especially since autonomous motivation did not correlate with other factors.

Practical implications

As earlier studies have suggested, teachers should incorporate metacognitive activities that help navigate and internalise assessment rubrics into their courses. This may have a beneficial effect on the students' feedback seeking, and in addition, may lead students to start working on their project earlier. Though the quality of the students' work was not included in this study, it is likely that these factors contribute to better student performance.

Future research

Future research may wish to replicate this study in an experimental setting so as to control for variations in course characteristics – such as the form and role of the rubric and final assignment – which the current study was not able to do. It could also ensure that enough participants are part of the rubric-input group and that these criteria-formulation activities would be of a homogeneous composition. Future studies could test whether the mechanisms behind SDT are at play when it comes to metacognitive activities and feedback seeking, in which case they should incorporate questions on the basic needs; self-efficacy;

students' opportunities for feedback seeking; and to what extent students were aware they could look for feedback. Clarification of the assessment criteria or practice in metacognition could support feelings of confidence or self-efficacy. Including these variables in future experiments can test whether they are the cause for an increase in feedback seeking, or whether motivation also plays a role.

Despite its flaws, this study's findings reveal the correlation that metacognitive activities have with feedback-seeking behaviour on students. Overall, this study confirms the importance of classroom activities for the employment of effective study strategies amongst students and offers direction for further research in this area.

References

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*(3), 261–271. https://doi-org./10.1037/0022-0663.84.3.261

Andrade, H. G. (2001). The effects of instructional rubrics on learning to write. *Current issues in education, 4*(4).

Andrade, H. G. (2005). Teaching with rubrics: The good, the bad, and the ugly. *College teaching, 53*(1), 27-31. https://doi-org./10.3200/CTCH.53.1.27-31

Andrade, H. L., Du, Y., & Wang, X. (2008). Putting rubrics to the test: The effect of a model, criteria generation, and rubric-referenced self-assessment on elementary school students' writing. *Educational Measurement: Issues and Practice, 27*(2), 3-13. https://doi-org./10.1111/j.1745-3992.2008.00118.x

Andrade, H., & Du, Y. (2005). Student perspectives on rubric-referenced assessment. *Practical Assessment, Research, and Evaluation, 10*(1), 3. https://doi.org/10.7275/g367-ye94

Andrade, H., & Valtcheva, A. (2009). Promoting learning and achievement through self-assessment. *Theory Into Practice, 48*(1), 12–19. https://doi.org/10.1080/00405840802577544

Anseel, F., Beatty, A. S., Shen, W., Lievens, F., & Sackett, P. R. (2015). How are we doing after 30 years? A meta-analytic review of the antecedents and outcomes of feedback-seeking behavior. *Journal of management, 41*(1), 318-348. https://doi-org./10.1177/01492063134845

Ashford, S. J. (1986). Feedback-seeking in individual adaptation: A resource perspective. *Academy of Management journal, 29*(3), 465-487. https://doi.org/10.5465/256219

Barak, M. (2010). Motivating self-regulated learning in technology education. International Journal of Technology and Design Education, 20(4), 381-401. https://doi-org./10.1007/s10798-009-9092-x

Beenen, G., Pichler, S., & Levy, P. E. (2017). Self-determined feedback seeking: The role of perceived supervisor autonomous motivation support. *Human Resource Management, 56*(4), 555-569. https://doi-org./10.1002/hrm.21787

Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomous motivation support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science education, 84*(6), 740-756. https://doi-org./10.1002/1098-237X(200011)84:6<740::AID-SCE4>3.0.CO;2-3

Bloxham, S., & West, A. (2007). Learning to write in higher education: Students' perceptions of an intervention in developing understanding of assessment criteria. *Teaching in Higher Education, 12*(1), 77-89. https://doi-org./10.1080/13562510601102180

Borsboom, D., Cramer, A. O., Kievit, R. A., Scholten, A. Z., & Franić, S. (2009). The end of construct validity. In In R. W. Lissitz (Ed.), *The concept of validity: Revisions, new directions and applications* (pp. 135-170). IAP Information Age Publishing. Retrieved August 23rd 2022 via https://psycnet-apa-org./record/2009-23060-007

Bouffard-Bouchard, T., Parent, S., & Larivee, S. (1991). Influence of self-efficacy on self-regulation and performance among junior and senior high-school age students. *International journal of behavioral development, 14*(2), 153-164. https://doi-org./10.1177/016502549101400203

Browne, M.W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research, 21*, 230–258. https://doi-org./10.1177/0049124192021002005

Crommelinck, M., & Anseel, F. (2013). Understanding and encouraging feedback-seeking behaviour: a literature review. *Medical education, 47*(3), 232-241. https://doi-org./10.1111/medu.12075

Everaert, P., Opdecam, E., & Maussen, S. (2017). The relationship between motivation, learning approaches, academic performance and time spent. *Accounting Education, 26*(1), 78-107. https://doi-org./10.1080/09639284.2016.1274911

Evers, A. V. A. M., Lucassen, W., Meijer, R., & Sijtsma, K. (2009). COTAN beoordelingssysteem voor de kwaliteit van test. Amsterdam: NIP. Retrieved August 23rd 2022 via https://pure.uva.nl/ws/files/896125/79346_312828.pdf

Falchikov, N. (2004). Involving students in assessment. *Psychology Learning & Teaching, 3*(2), 102-108. https://doi-org./10.2304/plat.2003.3.2.102

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.) Sage.

Fraile, J., Panadero, E., & Pardo, R. (2017). Co-creating rubrics: The effects on self-regulated learning, self-efficacy and performance of establishing assessment criteria with students. *Studies in Educational Evaluation, 53*, 69-76. https://doi.org/10.1016/j.stueduc.2017.03.003

Gibbs, G. (2010). *Using assessment to support student learning.* Leeds Met Press.

Jones, B. D., Ruff, C., Snyder, J. D., Petrich, B., & Koonce, C. (2012). The Effects of Mind Mapping Activities on Students' Motivation. *International journal for the scholarship of teaching and learning*, *6*(1), 1-21. Retrieved August 23rd 2022 via https://eric.ed.gov/?id = EJ1145213

Kyriazos, T. A. (2018). Applied psychometrics: sample size and sample power considerations in factor analysis (EFA, CFA) and SEM in general. *Psychology, 9*(08), 2207. Doi: 10.4236/psych.2018.98126

Leenknecht, M. J., & Prins, F. J. (2018). Formative peer assessment in primary school: the effects of involving pupils in setting assessment criteria on their appraisal and feedback style. *European Journal of Psychology of Education, 33*(1), 101-116. https://doi-org./10.1007/s10212-017-0340-2

Leenknecht, M., Wijnia, L., Köhlen, M., Fryer, L., Rikers, R., & Loyens, S. (2021). Formative assessment as practice: the role of students' motivation. *Assessment & Evaluation in Higher Education, 46*(2), 236-255. https://doi-org./10.1080/02602938.2020.1765228

Leenknecht, M., Hompus, P., & Van der Schaaf, M. (2019). Feedback seeking in higher education: the association with students' goal orientation and deep learning approach. *Assessment & Evaluation in Higher Education, 44*(7), 1069-1078. https://doi-org./10.1080/02602938.2019.1571161

Legault, L., & Inzlicht, M. (2013). Self-determination, self-regulation, and the brain: autonomous motivation improves performance by enhancing neuroaffective responsiveness to self-regulation failure. *Journal of personality and social psychology, 105*(1), 123. https://doi-org./10.1037/a0030426

Pallant, J. (2011). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (4th ed). Routledge.

Panadero, E., & Jonsson, A. (2013). The use of scoring rubrics for formative assessment purposes revisited: A review. *Educational Research Review, 9,* 129–144. http://dx.doi.org/10.1016/j.edurev.2013.01.002. https://doi.org/10.1016/j.edurev.2013.01.002

Panadero, E., & Romero, M. (2014). To rubric or not to rubric? The effects of self-assessment on self-regulation, performance and self-efficacy. *Assessment in Education: Principles, Policy & Practice, 21*(2), 133-148. https://doi-org./10.1080/0969594X.2013.877872

Peat, B. (2006). Integrating writing and research skills: Development and testing of a rubric to measure student outcomes. *Journal of Public Affairs Education, 12*, 295– 311. https://doi-org./10.1080/15236803.2006.12001437

Reddy, Y. M., & Andrade, H. (2010). A review of rubric use in higher education. *Assessment & evaluation in higher education, 35*(4), 435-448. https://doi-org./10.1080/02602930902862859

Reynolds-Keefer, L. (2010). Rubric-referenced assessment in teacher preparation: An opportunity to learn by using. *Practical Assessment, Research, and Evaluation, 15*(1), 8. https://doi.org/10.7275/psk5-mf68

Rheinberg, F., Vollmeyer, R., & Burns, B. D. (2000). Motivation and self-regulated learning. *Advances In Psychology Amsterdam, 131*, 81-108. https://doi.org/10.1016/S0166-4115(00)80007-2

Rodgers, W. M., Markland, D., Selzler, A. M., Murray, T. C., & Wilson, P. M. (2014). Distinguishing perceived competence and self-efficacy: An example from exercise. *Research quarterly for exercise and sport, 85*(4), 527-539. https://doi-org./10.1080/02701367.2014.961050

Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: examining reasons for acting in two domains. *Journal of personality and social psychology, 57*(5), 749. https://doi-org./10.1037/0022-3514.57.5.749

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness.* Guilford Publications.

Schamber, J. F., & Mahoney, S. L. (2006). Assessing and improving the quality of group critical thinking exhibited in the final projects of collaborative learning groups. *The Journal of General Education, 55*(2), 103-137. https://doi.org/10.1353/jge.2006.0025

Tillema, H. (2014). Student involvement in assessment of their learning. In *Designing assessment for quality learning* (pp. 39-53). Springer, Dordrecht. https://doi-org./10.1007/978-94-007-5902-2_3

Tillema, H., Leenknecht, M., & Segers, M. (2011). Assessing assessment quality: Criteria for quality assurance in design of (peer) assessment for learning–a review of research studies. *Studies in Educational Evaluation, 37*(1), 25-34. https://doi.org/10.1016/j.stueduc.2011.03.004

Torrance, H. (2007). Assessment as learning? How the use of explicit learning objectives, assessment criteria and feedback in post-secondary education and training can come to dominate learning. *Assessment in Education, 14*(3), 281-294. https://doi-org./10.1080/09695940701591867

Vansteenkiste, M., Sierens, E., Soenens, B., Luyckx, K., & Lens, W. (2009). Motivational profiles from a self-determination perspective: the quality of motivation matters. *Journal of educational psychology, 101*(3), 671. https://doi.org/10.1037/a0015083

Williams, J. R., & Johnson, M. A. (2000). Self-Supervisor Agreement: The Influence of Feedback Seeking on the Relationship Between Self and Supervisor Ratings of Performance 1. *Journal of Applied Social Psychology, 30*(2), 275-292. https://doi.org/10.1111/j.1559-1816.2000.tb02316.x

Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in quantitative methods for psychology, 9*(2), 79-94. Retrieved August 23rd 2022 via https://sites.ualberta.ca/~lkgray/uploads/7/3/6/2/7362679/exploratoryfactoranalysis.pdf

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American*

educational research journal, *45*(1), 166-183. https://doi-org./10.3102/00028312073129

Appendices

Appendix A. The Surveys

Descriptive data

Voor welke cursus vul je deze vragenlijst in?

Dit geldt alleen voor studenten die een cursus nummer van hun docent hebben gekregen voor deze vragenlijst
[text box for reply]

Ik ben

- Hbo student
- Wo student
- Anders: ...

Hoelang ben je al bezig met de cursus en het project?
[numeral sliders]

- ... weken geleden begon de cursus
- ... weken geleden begon ik aan de eindopdracht
- ... weken totaal tussen begin cursus en inleveren eindopdracht

Wanneer heeft u de (eerste versie van de) rubric mogen **inzien**?

- De rubric werd aan het begin van de cursus gedeeld
- De rubric werd enkele weken voor de deadline gedeeld
- We konden de rubric niet of nauwelijks inzien voor de deadline

In welke mate was u **betrokken** bij het **creëren** van de criteria voor het eindproject?
Meerdere antwoorden zijn mogelijk.

- Ik was deel van de criteria formulering
- Ik heb feedback mogen geven op de criteria die verwerkt kon worden binnen het tijdspad van de cursus
- Ik had de optie op een van deze manieren betrokken te zijn, maar heb dit niet gedaan
- Feedback geven kan, maar dit is voor toekomstige versies van de cursus
- Niet betrokken

Werd de rubric betrokken bij **cursus activiteiten**?
Dit zijn activiteiten die onderdeel van het cursus huiswerk of lestijd waren.

Meerder antwoorden zijn mogelijk.

- Formatieve peer assessment
- Formatieve self-assessment
- Het toepassen van een rubric op een voorbeeld opdracht
- Klassikale reflectie op de rubric
- De rubric hebben we samen met de docent opgesteld of aangepast
- Rubric werd NIET betrokken bij cursus activiteiten
- Een andere activiteit

Questionnaires

The questionnaires made use of a 5-point Likert scale.

The questionnaire on the psychological needs contained these items:

Je hebt tijdens dit semester tijd besteed aan deze cursus (denk aan lessen en zelfstudie).
Wat is voor jou een reden om te studeren voor deze cursus?

1. dat ik wil dat anderen denken dat ik een goede student ben
2. dat ik dit leuk vind
3. dat ik in moeilijkheden kom als ik het niet doe
4. dat ik meer over het onderwerp te weten wil komen
5. dat ik me slecht zou voelen als ik het niet deed
6. dat ik hiertoe verplicht word
7. eigenlijk geen. Ik vind het een saaie cursus
8. dat ik er iets van kan leren
9. dat ik hiertoe gedwongen word
10. dat ik verondersteld word dat te doen
11. dat ik dit een zeer boeiende cursus vind
12. dat ik me schuldig zou voelen als ik het niet deed
13. dat de inhoud ervan later voor mij nog persoonlijk zinvol kan zijn
14. dat ik een goede beoordeling wil halen voor de cursus
15. dat ik de cursus erg interessant vind
16. dat het voor mij persoonlijk belangrijk is om de cursus te volgen

The questionnaire on autonomous motivation contained items:

1. Had ik een gevoel van keuze en vrijheid in de dingen die ik deed.
2. Voelde ik me uitgesloten uit de groep waar ik bij wilde horen.
3. Voelde ik me gedwongen om veel oefeningen te doen waar ik zelf niet voor zou kiezen.
4. Had ik ernstige twijfels of ik oefeningen wel goed kon doen.
5. Voelde ik me nauw verbonden met klasgenoten die belangrijk voor me zijn.
6. Had ik het gevoel dat de oefeningen aansloten bij wat ik zelf zou willen.
7. Voelde ik me onzeker over mijn vaardigheden.
8. Had ik de indruk dat de klasgenoten waarmee ik tijd doorbracht een hekel aan me hadden.
9. Had ik er vertrouwen in dat ik de oefeningen goed kon doen.
10. Voelde ik me verplicht om te veel oefeningen te doen.
11. Voelde ik dat de klasgenoten waar ik om geef, ook geven om mij.
12. Voelde ik me in staat om mijn doelen te bereiken.
13. Had ik het gevoel dat de manier waarop ik les kreeg, was zoals ik zelf ook wil.
14. Voelde ik dat de relaties die ik met klasgenoten had slechts oppervlakkig waren.
15. Voelde ik me bekwaam in wat ik deed.
16. Voelde ik me onder druk gezet om bepaalde dingen te doen.
17. Voelde ik me teleurgesteld in veel van mijn prestaties.
18. Voelde ik me verbonden met de klasgenoten die om mij geven en waar ik ook om geef.
19. Voelden de meeste oefeningen en opdrachten die ik deed aan alsof ‘ze moesten’.

20. Voelde ik dat ik moeilijke taken met succes kon voltooien.
21. Had ik het gevoel dat klasgenoten die belangrijk voor zijn koud en afstandelijk waren tegen mij.
22. Voelde ik dat wat we deden in de les me oprecht interesseerde.
23. Voelde ik me als een mislukkeling omwille van de fouten die ik maakte.
24. Had ik een warm gevoel bij klasgenoten waarmee ik tijd doorbracht.

The questionnaire on feedback-seeking behaviour contained these items:

1. Hoe vaak heb je aan je medestudenten gevraagd hoe zij ervaren hoe jij samenwerkt binnen de projectgroep?
2. Hoe vaak heb je aan je docent gevraagd hoe hij/zij ervaart hoe jij samenwerkt binnen de projectgroep?
3. Hoe vaak heb je je eigen prestaties vergeleken met hoe je medestudenten uit je projectgroep presteren?
4. Hoe vaak heb jij gelet op wat de docent zegt over jou inzet in de projectgroep?
5. Hoe vaak heb je aan je medestudenten gevraagd hoe goed je in het project presteert?
6. Hoe vaak heb je aan je docent gevraagd hoe goed je in het project presteert?
7. Hoe vaak heb je projectleden geobserveerd die van de docent positieve feedback kregen op hun prestaties of geschreven stukken?
8. Hoe vaak heb je aan je medestudenten gevraagd hoe je je taak binnen het project het beste kon uitvoeren?
9. Hoe vaak heb je aan de docent gevraagd hoe je je taak binnen het project het beste kunt aanpakken, zodat dit leidt tot het behalen van het project?
10. Hoe vaak besteedde je aandacht aan ongevraagde feedback van anderen (feedback waar je niet om gevraagd hebt)?
11. Hoe vaak besteedde je aandacht aan (toevallige) opmerkingen gemaakt door anderen over je prestaties in het project?

Seperate survey:
Terugkoppeling ontvangen en/of meedoen aan de loting

Erg bedankt voor het meedoen aan mijn vragenlijst!

Hoe zou ik je kunnen bereiken?
Deze data kan niet gekoppeld worden aan de data van je deelname.
[text box]

Ben je geïnteresseerd in een samenvatting van de resultaten van mijn onderzoek, en/of wil je meedoen met de loting voor de cadeaukaart? *[multiple choice]*

- Ik ontvang graag een samenvatting van de resultaten
- Ik wil meedoen met de loting
- Beide!

Appendix B. EFA Results

Table B1

Results From an Explorative Factor Analysis of the Shortened Self-Regulation– Academic Questionnaire

Item	Factor loading	
	1	2
Factor 1 – Autonomous motivation		
dat ik dit leuk vind	**.760**	-0.117
dat ik meer over het onderwerp te weten wil komen	**.864**	-0.026
dat ik er iets van kan leren	**.808**	0.069
dat ik dit een zeer boeiende cursus vind	**.871**	0.023
dat de inhoud ervan later voor mij nog persoonlijk zinvol kan zijn	**.633**	0.226
dat ik de cursus erg interessant vind	**.848**	-0.072
dat het voor mij persoonlijk belangrijk is om de cursus te volgen	**.450**	0.089
Factor 2 – Conscience motivation		
dat ik me slecht zou voelen als ik het niet deed	0.037	**.841**
dat ik me schuldig zou voelen als ik het niet deed	-0.058	**.743**

Note. $N = 70$. An oblique rotation was applied. Factor loadings above .3 are in bold.

Table B2

Results From an Explorative Factor Analysis of the Shortened Feedback Seeking Scale Questionnaire

Item	**Factor loading**	
	1	**2**
Factor 1 - Inquisitory Feedback Seeking		
Hoe vaak heb je aan je medestudenten gevraagd hoe zij ervaren hoe jij samenwerkt binnen de projectgroep?	**.634**	.071
Hoe vaak heb je aan je docent gevraagd hoe hij/zij ervaart hoe jij samenwerkt binnen de projectgroep?	**.626**	-.092
Hoe vaak heb je aan je medestudenten gevraagd hoe goed je in het project presteert?	**.851**	.025
Hoe vaak heb je aan je docent gevraagd hoe goed je in het project presteert?	**.805**	-.094
Factor 2 - Monitoring Feedback Seeking		
Hoe vaak heb je je eigen prestaties vergeleken met hoe je medestudenten uit je projectgroep presteren?	.208	**.432**
Hoe vaak heb je projectleden geobserveerd die van de docent positieve feedback kregen op hun prestaties of geschreven stukken?	.266	**.440**
Hoe vaak besteedde je aandacht aan ongevraagde feedback van anderen (feedback waar je niet om gevraagd hebt)?	-.067	**.899**
Hoe vaak besteedde je aandacht aan (toevallige) opmerkingen gemaakt door anderen over je prestaties in het project?	.033	**.884**

Note. $N = 70$. An oblique rotation was applied. Factor loadings above .3 are in bold.

Appendix C. Information Provided During Data Collection

Information Presented at the Start of the Survey

Informatiebrief vragenlijstonderzoek
Leerprestaties rondom rubrics
Celine Giepmans
Universiteit Utrecht

Doe mee en maak kans op een bol.com cadeaukaart t.w.v. €10,-!
Aan het eind van de vragenlijst kan je je voegen bij de loting hiervoor. Om de anonimiteit de waarborgen, zal deze loting volledig los staan van de data die in deze vragenlijst wordt verzameld.

Introductie
Ik wil je vragen of je bereid bent deel te nemen aan mijn wetenschappelijk onderzoek voor mijn scriptie voor de Master Educational Sciences. Dit onderzoek is getoetst en goedgekeurd door de Facultaire Ethische Toetsingscommissie (FETC) van de Faculteit Sociale Wetenschappen van de Universiteit Utrecht en voldoet aan de ethische richtlijnen. Meedoen met de data verzameling is vrijwillig en je kan te allen tijde stoppen zonder dat je hiervoor een reden hoeft op te geven. Voordat je beslist of je wilt meedoen aan dit onderzoek, wil ik je hieronder informeren over wat het onderzoek precies inhoudt en welke vragen je kan verwachten.
Lees deze informatie rustig door en neem gerust contact op via het e-mailadres onderaan deze e-mail als je vragen hebt.

Opzet/uitvoering van het onderzoek
Je krijgt een vragenlijst voorgelegd. Het invullen hiervan duurt ongeveer 20 minuten. Aan het eind van het onderzoek zal worden verteld wat het exacte doel van het onderzoek was.

Achtergrond onderzoek
Rubrics zijn een toetsingshulpmiddel die bestaat uit criteria, beschrijvingen van de verschillende prestatie niveaus en beoordelingsstrategie. Rubrics zorgen voor betere leerprestaties dan veel andere vormen van evaluatie, omdat ze meer inzicht in de beoordeling bieden. Dit onderzoek gaat dieper in op variabelen die bijdragen aan leerprestaties bij het gebruik van rubrics.

Wat wordt van jou als participant verwacht
Als je meedoet aan het onderzoek, verzamel ik enkel data uit de vragenlijst van jou. Deze vragenlijst bestaat uit enkele vragen over de cursus die je op dit moment volgt, vragen met betrekking tot jouw motivatie en vragen met betrekking tot feedback zoekend gedrag. Deze duurt ongeveer 20 minuten. De vragenlijst staat open tot juli.

Mogelijke voor- en nadelen van het onderzoek
Er zijn verder geen voor- of nadelen bij het deelnemen van het onderzoek.

Vergoeding/beloning

Je kan meedoen aan een loting voor een cadeaubon aan het einde van de vragenlijst.

Vertrouwelijkheid verwerking gegevens
Ik gebruik voor dit vragenlijstonderzoek het software programma Qualtrics. Dit programma verzamelt de data op anonieme basis voor me, en er worden geen ip-adressen verzameld. Verder worden in de vragenlijst geen direct identificerende gegevens uitgevraagd. Aan het einde van de vragenlijst heb je nog een keer de optie om je data te laten verwijderen. Hierna is dit niet meer mogelijk. Omdat het onderzoek anoniem wordt uitgevoerd betekent dit ook dat je jouw gegevens niet achteraf kan laten verwijderen. Wel kan je uiteraard te allen tijde stoppen met de vragenlijst.
De verzameling van de contact gegevens voor een algemene terugkoppeling met de resultaten van het onderzoek of voor het meedoen aan de cadeaubon loting staat los van deze vragenlijst. Hiervoor word je doorgestuurd naar een tweede survey-link. Dit kan niet gekoppeld worden aan de data die in dit onderzoek wordt verzameld. Het is daarbij optioneel en vrijwillig. De data uit deze losse verzameling wordt vernietigd zodra de terugkoppelingen verstuurd zijn en de cadeaukaart door de winnaar ontvangen is.
Indien je het unieke cursusnummer invoert waarvoor je de vragenlijst maakt, wordt deze data ook gebruikt voor een aparte analyse van deze cursus. Deze data wordt aan de cursus coördinator gepresenteerd in de vorm van een collectieve analyse en kan zo niet naar jouw persoon worden terug geleid. Docenten hebben geen toegang tot de ruwe data.
De ruwe data (onderzoeksgegevens) zullen voor minimaal 10 jaar bewaard worden door de Universiteit van Utrecht. Dit is volgens de daartoe bestemde richtlijnen van de VSNU. De verkregen data wordt niet publiek gemaakt.

Vrijwilligheid deelname
Deelname aan dit onderzoek is vrijwillig. Je kan op elk gewenst moment, zonder opgave van reden en zonder voor jou nadelige gevolgen, je terugtrekken uit de dataverzameling.
Als je na het lezen van deze informatie besluit tot deelname ga je akkoord door middel van het aanvinken van het vakje ‘akkoord’. Daarna word je automatisch naar de online omgeving voor het invullen van de vragenlijst geleid.

Voor vragen kan je terecht bij:
Celine Giepmans
c.r.w.m.giepmans@students.uu.nl

Voor klachten over het onderzoek kan je terecht bij:
klachtenfunctionaris-fetcsocwet@uu.nl

Debriefing Information Letter
Presented at the end of online survey

Tweede informatiebrief vragenlijstonderzoek
Leerprestaties rondom rubrics
Celine Giepmans
Universiteit Utrecht

Introductie

Eerder heb ik je gevraagd deel te nemen aan mijn onderzoek. Nogmaals dank hiervoor. Bij deze kan ik vertellen wat het exacte doel was van het onderzoek.

Achtergrond onderzoek
Rubrics zijn een toetsingshulpmiddel die bestaan uit criteria, beschrijvingen van de verschillende prestatie niveaus, en beoordelingsstrategie. Rubrics zorgen voor betere leerprestaties dan veel andere vormen van evaluatie, omdat ze meer inzicht in de beoordeling bieden en zelfregulering faciliteren.
De variabelen die onderzocht zijn waren:

1. inbreng hebben bij de vormgeving van de rubric
2. autonome motivatie
3. feedback-zoekend gedrag

Sommigen van jullie hadden wellicht inbreng in de formulering van de rubric criteria. Zulke inbreng vergroot waarschijnlijk de voldoening van de psychologische behoeften van de zelf-determinatie theorie – autonomie, competentie en relaties. Dit zorgt voor meer autonome motivatie. Deze motivatie kan feedback-zoekend gedrag bevorderen. Feedback-zoekend gedrag is een vorm van zelfregulering. Dit onderzoek wil nagaan of dat deze ketting van factoren significant aan elkaar verbonden zijn.

Vrijwilligheid deelname
Deelname aan dit onderzoek is vrijwillig. Mocht je je willen terugtrekken uit de data-verzameling, dan kan je dit op de volgende pagina doen.

Voor vragen kan je terecht bij:
Celine Giepmans
c.r.w.m.giepmans@students.uu.nl

Voor klachten over het onderzoek kan je terecht bij:
klachtenfunctionaris-fetcsocwet@uu.nl

Digital Informed Consent Form

Onderzoek naar leerprestaties bij gebruik van rubrics
Toestemmingsverklaring voor gebruik gegevens ten behoeve van het onderzoek

Ik wil aan dit onderzoek meedoen.

Ik heb informatie van de onderzoekers over het onderzoek gekregen.
Eventuele vragen die ik had zijn voldoende beantwoord.
Ik weet dat meedoen helemaal vrijwillig is. Ik weet dat ik op ieder moment kan beslissen om toch niet mee te doen. Daarvoor hoef ik geen reden op te geven.
Ik geef toestemming om mijn gecodeerde gegevens te gebruiken in het onderzoek.
Gegevens die de onderzoekers voor het onderzoek bewaren zijn niet te herleiden naar mijn persoon.

Ik weet dat de onderzoeksgegevens en het toestemmingsformulier na het onderzoek nog 10 jaar bewaard worden en daarna worden vernietigd.

o Akkoord

Appendix D. Descriptives

Table D1

Descriptives for the Stage in Project

	M	*Mdn*	*SD*	*Min*	*Max*
Percentage of course time in weeks spent on project (Percentage of Time Spent on Project)	50.7%	33.3%	34.5%	10%	100%
Start of course … weeks ago	9.03	8	2.73	2	18
Start of project … weeks ago	4.17	3	3.93	0	16
Total length of course in weeks	9.71	10	2.53	2	20

Note. $N = 59$.

Table D2

Descriptives for the Feedback-Seeking Scales and Items

	M	*Mdn*	*SD*	*Min*	*Max*
1 Hoe vaak heb je aan je medestudenten gevraagd hoe zij ervaren hoe jij samenwerkt binnen de projectgroep?	2.36	2	1.27	1	5
2 Hoe vaak heb je aan je docent gevraagd hoe hij/zij ervaart hoe jij samenwerkt binnen de projectgroep?	1.75	1	1.04	1	5
5 Hoe vaak heb je aan je medestudenten gevraagd hoe goed je in het project presteert?	2.20	2	1.13	1	5
6 Hoe vaak heb je aan je docent gevraagd hoe goed je in het project presteert?	1.88	1	1.12	1	5
Inquisitory Feedback Seeking	2.05	1.75	.92	1	4.25
3 Hoe vaak heb je je eigen prestaties vergeleken met hoe je medestudenten uit je projectgroep presteren?	3.61	4	1.39	1	6
7	2.54	2	1.43	1	6

	M	*Mdn*	*SD*	*Min*	*Max*
Hoe vaak heb je projectleden geobserveerd die van de docent positieve feedback kregen op hun prestaties of geschreven stukken?					
10	3.03	3	1.61	1	6
Hoe vaak besteedde je aandacht aan ongevraagde feedback van anderen (feedback waar je niet om gevraagd hebt)?					
11	3.07	3	1.57	1	6
Hoe vaak besteedde je aandacht aan (toevallige) opmerkingen gemaakt door anderen over je prestaties in het project?					
Monitoring Feedback Seeking	3.06	3.25	1.20	1	5.5
Total Feedback Seeking	1.70	1.75	.64	.58	2.98

Note. $N = 59$.

Table D3

Descriptives for the Motivation Scales and Items

	M	*Mdn*	*SD*	*Min*	*Max*
2	3	3	.87	1	4
dat ik dit leuk vind					
4	3.03	3	.95	1	4
dat ik meer over het onderwerp te weten wil komen					
8	3.27	3	.76	1	4
dat ik er iets van kan leren					
11	2.78	3	1.00	1	4
dat ik dit een zeer boeiende cursus vind					
13	3.37	4	.95	1	4
dat de inhoud ervan later voor mij nog persoonlijk zinvol kan zijn					
15	2.97	3	.91	1	4
dat ik de cursus erg interessant vind					
16	2.90	3	.92	1	4
dat het voor mij persoonlijk belangrijk is om de cursus te volgen					
Intrinsic	**3.05**	**3.14**	**.72**	**1.29**	**4**
5	2.85	3	1.01	1	4
dat ik me slecht zou voelen als ik het niet deed					

	M	*Mdn*	*SD*	*Min*	*Max*
12 dat ik me schuldig zou voelen als ik het niet deed	2.49	2	1.04	1	4
Conscience	**2.67**	**2.5**	**.92**	**1**	**4**
Total motivation	**2.96**	**3**	**.61**	**1.44**	**4**

Note. $N = 59$.

Table D4

Descriptives of the Standardised Scale Scores

	M	*Mdn*	*SD*	*Min*	*Max*
Motivation Total	.742	.750	.153	.36	1
Motivation Intrinsic	.762	.786	.180	.32	1
Motivation Conscience	.667	.625	.230	.25	1
Feedback Seeking Total	.284	.291	.106	.1	.5
Inquisitory Feedback Seeking	.341	.292	.154	.17	.71
Monitoring Feedback Seeking	.511	.542	.2	.17	.92

Note. $N = 59$.

Appendix E. Remarks Left at the End of the Survey

Remarks	Course
Mijn project heeft eigenlijk niet veel begeleiding vanuit de opleiding. Een docent houdt de grote lijnen bij, maar geeft niet echt persoonlijke feedback over elk teamlid. Wij werken zelfstandig aan een eindproduct waarbij de rubric als leidraad.	-
Ik vind veel vragen moeilijk toepasbaar op de realiteit. Elk vak heeft tegenwoordig rubrics. En de meeste staan vast en zijn niet inzichtelijk voor studenten tot na de beoordeling. Dat in jouw studie onderwijskunde veel wordt gepraat over beoordeling is logisch wellicht. Ik heb echter in mijn twee bachelors en master nog nooit meegemaakt dat studenten werden betrokken bij de beoordelingseisen. Ook is tussendoor feedback aan elkaar geven wellicht een normaal onderdeel in jouw didactische studie, dit is ook niet de realiteit in veel andere disciplines. Men doet een groepsopdracht, en men krijgt een cijfer. Er wordt zelden gereflecteerd op elkaar. Laat staan door de docent. Dat gebeurde in mijn HBO-opleiding wel soms. Op de universiteit heb ik dit echter nog nooit meegemaakt. Lang verhaal kort: ik denk dat je een verkeerd beeld hebt van hoe beoordelingen door docenten in de praktijk gaan in de meeste studies buiten onderwijskunde. Dat is een weinig interactief proces waar rubrics alleen worden ingezet om willekeur te voorkomen en het makkelijker te maken om grote hoeveelheden werk te beoordelen in kleine tijd. Het heeft mijns inziens niets met de betrokkenheid van studenten verhogen te maken.	2
soms wil ik invullen: niet van toepassing. Echter is dit niet mogelijk. Bijvoorbeeld bij de vragen over een groepsopdracht	3
Het zou fijn zijn als er ook een mogelijkheid is om terug te gaan naar de vorige vragen.	2
Niet elke eindopdracht betreft projectleden.	
Het is onhandig dat je niet terug kan, zo had ik sommige antwoorden later nog willen veranderen toen ik ze beter begreep, maar dat kon niet meer.	2
Ook leken veel vragen op elkaar bij de laatste vraag.	
Vragen sluiten niet aan bij de cursus. Er is geen groepsproject en de eindopdracht was een mondeling tentamen.	2
vragen sluiten niet aan bij de cursus; er is geen sprake van een projectgroep en de eindopdracht is een mondelinge toets.	2
Deze cursus is wat anders dan normaal, omdat het voornamelijk bestond uit coschappen en niet zozeer een projectgroep.	2
In de vragenlijst zag ik de docent als mijn coschapbegeleider en medestudenten als de assistenten, dit leek mij meer van toepassing op de type cursus (coschappen).	2
Op dit moment volg ik de cursus coschappen in de apotheek. Het is daarom lastig om de vragen te beantwoorden. Er is niet echt een docent. Alleen een docent in de onderwijsgroep waar we relatief weinig les van	2

Remarks	Course
hebben. Verder is er dus geen projectgroep. Ik heb de vragen beantwoord o.b.v. de les met een docent in de onderwijsgroep.	
In deze cursus hebben we geen project gehad (maar wel stage). Met de docent bedoelde ik de stagebegeleider en met de medestudenten bedoelde ik de apothekersassistentes.	2
deze cursus betreft een stage, dus er is niet veel sprake van beoordeling dmv medestudenten. Ik heb het hier dus ingevuld als beoordeling/advies van stage mensen.	2
De volgende keer een kopje 'Niet van toepassing' als optie geven. Ik heb deze cursus helemaal geen project gedaan in een groepje, dus dan krijg je scheve antwoorden.	2
(cursus 2)	

Appendix F. Correlations

Table F1

Spearman's Rho Correlations for the Independent and Dependent Variables

	1	2	3	4	5	6	7
1. Inquisitory Feedback Seeking	-	-	-	-	-	-	-
2. Monitoring Feedback Seeking	.449***	-	-	-	-	-	-
3. Feedback Seeking	.522***	.992***	-	-	-	-	-
4. Autonomous motivation	.091	.183	.172	-	-	-	-
5. Percentage of Time Spent on Project	.082	.349**	.349**	.175	-	-	-
6. Metacognitive Activities	.399**	.231	.264*	-.001	.309*	-	-
7. Rubric Input	.036	-.023	-.035	-.090	.021	.178	-

Note: N = 59. *p < .05. **p < .01. ***p < .001, 2-tailed.

Table F2

Pearson's R Correlations for Length of Course, Moment of Rubric Publication, Autonomous Motivation and Feedback-Seeking

	1	2	3	4
1. Length of Course	-	-	-	-
2. Moment of Rubric Publication	.124	-	-	-
3. Autonomous motivation	-.096	.106	-	-
4. Feedback seeking	-.012	-.103	.106	-

Note: N = 59. Amongst these variables, no significant correlations were detected ($p < .05$, 2-tailed).