From Criteria to Competence: Enhancing Peer Feedback Practices Among University

Students

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Table of Contents

Abstract

This study investigates various peer feedback strategies, particularly rubrics, exemplars and deconstructed rubrics, and their effectiveness in enhancing the quality of feedback and students' self-efficacy. Prior literature indicates that while peer feedback can significantly improve students' learning outcomes and critical skills development, however, the implementation of rubrics and exemplars requires careful contextual support to be effective (Brookhart, 2018; Carless et al., 2018; Hawe, 2021). The research question addresses which feedback approach—(1) using rubrics alone, (2) using exemplars with teacher-provided rubrics, or (3) deconstructing criteria before analysing exemplars—is most effective in improving peer feedback quality and students' self-efficacy. The prediction is that deconstructing criteria before analysing exemplars will result in the greatest improvement in feedback quality and self-efficacy due to deeper engagement with assessment criteria. A pre-post, between-subjects design was used to examine the effects of these feedback strategies among 40 university students divided into three groups corresponding to the different feedback approaches. Participants provided feedback on argumentative essays and their feedback quality (measured once) and self-efficacy (measured before and after the intervention) using inferential statistics. Results revealed no significant difference in feedback quality or self-efficacy among the three groups. These findings suggest that while peer feedback activities can improve self-efficacy, the specific implementation method may not significantly impact feedback quality. The study highlights the complexity of peer feedback approaches and calls for further research to explore innovative approaches and their applicability across different educational contexts. The implications highlight the need for continued investigation into effective peer feedback strategies to enhance educational practices and student development.

1. Introduction

Peer feedback is an effective instructional strategy to support students' learning processes and outcomes at a large scale (Er et al., 2021; Noroozi et al., 2016, 2023b; Taghizadeh Kerman et al., 2022a). This paper defines peer feedback as "an arrangement in which individuals consider the amount, level, value, worth, quality, or success of the products or outcomes of learning of peers of similar status" (Topping, 1998, p. 250). Giving feedback enables students to develop better critical revision skills, including problem detection and creating solutions, which can improve one's writing (Patchan & Schunn, 2015). Additionally, providing feedback contributes to better writing abilities as opposed to those who only receive feedback (Lundstrom & Baker, 2009).

In order to explore the topic of peer feedback, this study turns towards the foundation of social learning. According to Vygotsky (1978), learning is the transfer of knowledge and abilities from the social to the cognitive plane through apprenticeship and internalisation. This definition leads to Vygotsky's (1978) theory of social constructivism, stating that essentially everything is socially constructed. In the context of educational learning, this translates as learners construct knowledge, characterised by emphasis on contact, collaboration, and group work to achieve effective learning outcomes (Nawaz, 2012). Through the lens of facilitating learning by social construction, peer feedback is a potential opportunity in which students can engage with each other's learning products and enrich their knowledge through spoken and written dialogues (McGarrigle, 2013), as well as using rubrics to guide discussions (Topping, 2009).

Moreover, with this constructivist theory of learning in mind, Toohey (2000) developed a learning process model for higher education that includes feedback intervention as a form of facilitating process that helps students understand the material and apply it to various "real-world" scenarios. According to Toohey's concept, the extent to which feedback promotes learning relies on whether errors or misunderstandings are detected and whether recommendations are made to help students' work improve. These theories highlight the need for peer feedback from students' perspectives and maximising benefits.

Peer feedback, therefore, emerges as a powerful tool not only for a collaborative and interactive environment but also for enhancing individual learning as a consequence. More specifically, peer feedback allows students to engage more with the topics they work with, further contributing to their active learning and deepening their understanding (Bayat et al., 2022; Noroozi et al., 2022). In other words, having students give each other feedback breaks

down the large number of students (and the time it would take) within a group that would have to be addressed by a single teacher into a sort of rotation that could potentially be each student giving one other student feedback instead.

Another reason for the increasing popularity of peer feedback in higher education is the increased emphasis on improving knowledge (Hawe, 2021; Bayat et al., 2022; Noroozi et al., 2022) and complex skills (Sadler, 1989), including judgement and decision-making abilities (Bayat et al., 2022), as well as higher order thinking skills and communication skills (Ritzhaupt & Kumar, 2015). This includes writing (Noroozi et al., 2023b), inquiring and problem-solving (van der Pol, 2008), and argumentation skills (Noroozi & Hatami, 2019).

Despite the recognised advantages of peer feedback, concerns remain about the extent to which this process can be effectively implemented. To mitigate these concerns, teachers often use rubrics to guide students, but for rubrics to be effective, students need explicit instruction and contextual understanding (Hawe, 2021). To improve the understanding and application of rubrics, tools like exemplars—which serve as high-quality assignment examples—are beneficial (Carless et al., 2018). Combining rubrics with exemplars helps students provide more effective feedback by offering clear expectations and tangible quality benchmarks (Sadler, 1989; Brookhart, 2018). However, recent research by Latifi et al. (2023) suggests that scripting, involving detailed guidance and planning, may be more effective than exemplars alone. To address these limitations, interactive and participatory methods are recommended, with To et al. (2021) advocating for the combined use of rubrics and exemplars alongside strategies like peer or self-assessment to enhance feedback quality and academic self-regulation. This approach also aligns with the previously mentioned social constructivist model of assessment, which emphasises active engagement (Rust et al., 2005). Additionally, recent research into peer feedback also integrates the role of self-efficacy, emphasising that students' confidence in their ability to assess peers' work and provide constructive feedback significantly impacts their feedback quality and learning experience. Studies indicate that formative feedback (Rakoczy et al., 2019), positive reinforcement and scores (Beatson et al., 2018), and the use of rubrics (Smit et al., 2017) are linked to self-efficacy, where high self-efficacy leads to more effective peer feedback practices (Alqassab et al., 2019; Vattøy & Gamlem, 2023; Wei et al., 2024). However, there is also a need for research in this area, given that it has only recently become more popular.

This study adopts the first approach described by To et al. (2021) of deconstructing rubrics before analysing exemplars. The aim is to explore the effectiveness of the more active deconstruction approach compared to traditional rubric-only approaches and combined rubric and exemplar use. Additionally, it will investigate the relationship between self-efficacy and providing feedback to peers.

2. Theoretical Framework

2.1 Supporting Peer-Feedback with Rubrics

Despite the aforementioned advantages of peer feedback in literature, concerns remain about the extent to which this process can be effectively implemented. To mitigate these concerns, teachers often provide rubrics to guide students (Hawe, 2021). Rubrics serve as an essential tool for peer feedback processes by offering specific and clear standards for assessment. Having clear rubrics helps students grasp the specifications and expectations that will be used to evaluate their work when they participate in peer feedback activities (Brookhart, 2018). However, for these rubrics to be effective, students require explicit instruction and contextual understanding from their teachers or assessors (Hawe, 2021). Rubrics provide a systematic structure that outlines the attributes of various performance levels, aiding students in understanding the subtleties of quality standards (Brookhart, 2018).

Moreover, when using rubrics, students are guided toward a more impartial and consistent evaluation process, which encourages fairness and openness in peer-feedback interactions (Sadler, 1989). As students learn to evaluate their work and that of their classmates against predefined requirements, rubrics support the development of their critical thinking and evaluative skills (Andrade et al., 2005). However, additional support is not always sufficient to aid students' ability to provide feedback to others (Brookhart, 2018). Therefore, a tool to promote better comprehension and application of rubrics and learning outcomes is the introduction of exemplars.

2.2 Supporting Peer-Feedback with Rubrics and Exemplar

Combining rubrics with exemplars has been suggested as a more comprehensive approach to overcoming the difficulties in effectively implementing peer feedback. One way to approach this is by offering exemplars that meet high-quality standards alongside rubrics (Carless et al., 2018). Exemplars are used to help students contextualise abstract elements in educational settings by providing them with illustrations of quality standards (Sadler, 1989). According to Sadler (1989), exemplars provide students with a concrete point of reference for comprehending assignment objectives and recognising the characteristics of excellent work, which can then be transferred. Students who interact with exemplars learn how evaluative criteria are applied (rather than purely theoretical), improving their ability to differentiate between different quality levels and offer constructive criticism.

Moreover, the combination of rubrics and exemplars fosters a deep understanding of the predetermined objectives and learning outcomes as students actively compare their work to the elements of excellence of an exemplar (Carless et al., 2018). This dual approach not only improves the quality of feedback provided but also enhances students' academic self-regulation and comprehension of quality standards (To et al., 2021).

Despite the benefits highlighted by Sadler et al. (1989), Brookhart (2018), and Carless et al. (2018), recent research has criticised the effectiveness of exemplars. For instance, Latifi et al. (2023) found that even though exemplars improved feedback quality to some extent, scripting—a method involving detailed guidance and planning—proved more effective. This suggests that the benefits of exemplars vary depending on the context and methods adopted, questioning their overall effectiveness.

2.3 Deconstructing Rubrics Before Analysing Exemplars

To maximise the potential effectiveness of rubrics and exemplars in the peer feedback process, deconstructing rubrics before examining exemplars is advocated. By breaking down the criteria into different components, students can better understand the characteristics connected to each performance level (To et al., 2021). Additionally, it allows opportunities for active interactions with students and the given topic (Al Qunayeer, 2020). This method from To et al. (2021) encourages students to interact critically with the assessment criteria and form an advanced understanding of quality standards. Moreover, they suggest that the combined use of exemplars alongside strategies (i.e., rubrics, peer assessment, or self-assessment) was crucial not only in enhancing student's comprehension of the expected quality of work but also in improving the quality of feedback and fostering academic self-regulation (To et al., 2021).

To contrast this approach with combined rubrics and exemplars without deconstruction, a deeper understanding is achieved by critically analysing and engaging with the rubric, and analytical skills are strengthened. This, in turn, creates more meaningful and productive peer feedback (To et al., 2021). These activities preceded the analysis of exemplars, allowing students to internalise the criteria before comparing their work to high-quality examples (Carless et al., 2018). This ensures that students are not merely comparing their work superficially but are profoundly understanding the underlying standards that define quality.

Furthermore, deconstructing rubrics before analysing exemplars aligns with the social constructivist assessment model, which emphasises active engagement with all stages of the

assessment process (Rust et al., 2005). This engagement fosters a more profound comprehension of assessment processes, ultimately contributing to more meaningful and constructive peer-feedback interactions. By breaking down the criteria first, students can better appreciate the nuances of quality and apply this understanding when assessing exemplars, enhancing their feedback quality and learning outcomes (To et al., 2021).

2.4 Feedback Quality

A crucial factor in determining the benefits of feedback is its quality (Carless et al., 2011; Er et al., 2021). Over time, the conceptualisation of the term peer feedback has changed focus from the characteristics, quantity, and duration of feedback (Sluijsmans et al., 2002) to the current view, which is the alignment and accuracy of feedback (Gao et al., 2019). Peer feedback is currently considered a functional tool for improving the quality of work, characterised by problem detection accuracy and the usefulness of suggested solutions (Wu & Schunn, 2020).

Conditions at which feedback is given might affect its usefulness in different ways. High-quality feedback requires deeper cognitive processes (Misiejuk & Wasson, 2021) and higher-level thinking skills (Er et al., 2021). Lack of these abilities can lead to low-quality, superficial feedback, which makes peer feedback unproductive (Kerman et al., 2023; Huisman et al., 2018). Additionally, feedback is frequently neglected in the absence of crucial components like problem identification and solution-offering suggestions (Patchan et al., 2016; Wu & Schunn, 2021). Another essential component is clarity since effective feedback implementation depends on the recipient's understanding (Nelson & Schunn, 2009). For this reason, even in studies where all students are provided with identical instructions to provide feedback based on a rubric, not all students taking part are able to provide high-quality feedback (Noroozi et al., 2016, 2020). This highlights the importance of the features involved and types of feedback in providing peer feedback, which makes up the standard of feedback quality (Nelson & Schunn, 2009).

Due to all the features and elements that may be included to judge feedback quality, it is essential to note the different ways of operationalising feedback quality. Elements generally used to measure feedback quality include problem detection, the usefulness of suggested solutions, and the clarity of the feedback provided (Patchan & Schunn, 2015). Furthermore, in most argumentative essay feedback studies, the feedback quality is judged by similar criteria as the essay itself, as in the case of Noroozi et al. (2020). This creates a reasonable measure for students' feedback quality assessment for the methods section.

In summary, understanding the various aspects that affect feedback quality is crucial to guaranteeing its success in various educational settings. By operationalising feedback quality similarly to previous studies, a robust framework for assessment can be developed. In addition to assessment, this section lays the groundwork for understanding the current research on the topic of feedback quality and the areas for further research.

2.5 Self-Efficacy to Provide Peer-Feedback

Self-efficacy is another related variable to peer feedback that has recently been gaining popularity in research. Self-efficacy, as observed in the context of peer feedback, refers to a student's confidence in their ability to study other students' work and provide comments and suggestions for future improvement (Wei et al., 2024). Digging deeper into the relationship between peer feedback and self-efficacy, feedback features that result in better self-efficacy include formative feedback (Rakoczy et al., 2019), positive feedback and scores (Beatson et al., 2018), and rubrics that support peer- and self-assessment (Smit et al., 2017).

It is also essential to distinguish between higher self-efficacy and lower self-efficacy. The effects of self-efficacy on peer feedback are investigated in a study by Wei et al. (2024). It was discovered that pupils who have higher levels of self-efficacy have greater confidence when it comes to generating ideas, using language, and handling criticism (Wei et al., 2024). Additionally, the study also found that students with high levels of self-efficacy actively sought out guidance and examples from teachers to understand rubrics better. Conversely, low self-efficacy can result from emotional factors, such as reliability and response uncertainty (Wei et al., 2024), specifically, confidence in the student's knowledge and skills when providing feedback (Kasch et al., 2022). Peer reviews from groups with low and high levels of self-efficacy were also contrasted in the study. Despite the variations in the students' work, students with low self-efficacy provided similar criticism to the papers they provided feedback on (Wei et al., 2024). This is a potential consequence of a low level of understanding of the criteria and educator expectations, also finding it challenging to complete self-evaluations and provide comments in general (Wei et al., 2024).

Moreover, another recent study by Vattøy and Gamlem (2023) also indicated that self-efficacy is positively and significantly associated with the experiences of peer feedback practices. They suggest a possible relationship between higher levels of student confidence in their subject matter, with understanding of learning objectives and activities, and the ability to self-monitor (Vattøy & Gamlem, 2023). This contributes to their development in mastering giving peer

feedback as a skill. This high level of self-efficacy was also consistent with another study by Alqassab et al. (2019) that emphasised the usefulness of peer feedback as dependent on self-efficacy beliefs regarding the feedback giver's ability to deliver accurate peer feedback.

The relationship between peer feedback and feedback quality, as well as self-efficacy in the context of education in literature, does not provide a clear structure as to how to create the best approach and outcomes for peer feedback. To enhance peer feedback practices and contribute to the learning community, this paper will delve into and evaluate the use of (1) using rubrics alone, (2) exemplars with teacher-provided rubrics, and (3) deconstructing criteria to improve peer feedback practices among university students.

2.6 Research Questions

RQ1: Which approach – (1) using rubrics alone, (2) using exemplars with teacher-provided rubrics, or (3) deconstructing criteria before analysing exemplars – is most effective in improving peer feedback quality and self-efficacy of students?

3. Methods

3.1 Design

The present study employs a pre-post, between-subjects design methodology to investigate the impact of three distinct peer-feedback approaches on the quality of feedback students provide on their peers' assignments and their self-efficacy in providing peer-feedback. This design facilitates the measurement of changes in the dependent variables, namely, feedback quality and students' self-efficacy, as a consequence of exposure to the independent variable, which, in this case, consists of the three different peer-feedback approaches (refer to the *Procedure* section).

3.2 Participants

The sample consisted of 40 participants, of which 10 took part in Condition A (rubrics alone), 15 took part in Condition B (rubrics and exemplars), and 15 took part in Condition C (deconstructing criteria before analysing an exemplar). These participants were collected by snowball sampling through student networks and randomly assigned to one of the three conditions. See *Table 1* for an overview of the sample.

Table 1

Sociodemographic Characteristics of the Sample

Baseline Characteristic	Condition A		Condition B		Condition C		Full Sample	
	n	%	*n*	%	*n*	%	*n*	%
Gender								
Female	6	60	8	53.3	5	33.3	19	47.5
Male	3	30	6	40.0	10	66.7	19	47.5
Third gender/non-binary	1	10	1	6.7	0	0	2	5
Nationality								
Dutch	0	0	5	33.3	4	26.7	9	22.5
German	1	10	7	46.7	2	13.3	10	25
Other	9	90	3	20.0	9	60.0	21	52.5

Note. The average age for Condition A was 20.70 ($SD = 1.10$). The average age for Condition B was 21.20 ($SD = 1.68$). The average age for Condition C was 20.86 ($SD = 1.09$). For the full sample, the average age was 20.95 ($SD = 1.36$).

The inclusion criteria for participants were being over 18 and able to provide consent. The exclusion criteria were not being able to understand and give answers in English and having taken

part in the study previously to avoid practice effects and conform to expectations (i.e., the Rosenthal effect).

3.3 Materials

3.3.1 An Argumentative Essay

An argumentative essay was created with the help of OpenAI (2023), based on the argumentative essay instructions, to provide an essay to give feedback to (rather than ask participants to write their own). The quality of the essay was less than perfect, facilitating the process of identifying and giving peer feedback. For the argumentative essay, see *Appendix A*.

3.3.2 A Rubric for Peer Feedback

The rubric employed in the feedback-giving process was taken from Noroozi et al.'s (2023a) paper on designing, implementing, and evaluating an online supported peer feedback module (see *Appendix B*). The rubric was separated into sections by element, i.e., introduction, claim, arguments for the claim, support for arguments, response to counter-argument, and conclusion. Additionally, prompting questions were present to provide a clear understanding with step-by-step instructions on how to complete the feedback template.

3.3.3 An Exemplar

In the context of the current study, an exemplar refers to a similar assignment previously completed by a student in a prior iteration of a similar course assignment. Again, this material was taken from Noroozi et al.'s (2023a) paper on designing, implementing, and evaluating an online-supported peer feedback module. The research team also evaluated this assignment as high quality, based on the same rubrics employed for peer feedback (see *Appendix C*).

3.3.4 Instructions and Template for Peer Feedback

A document was developed based on Noroozi et al.'s paper for each condition to provide clear written instructions and avoid miscommunication. For the first condition, the instructions stated that the rubric should be used to give feedback. The second condition was a duplicate of the first one with the addition of the exemplar. At the same time, the third condition was the most elaborate, with instructions on the deconstruction of the criteria as well as the exemplar. Additionally, a template was crafted to facilitate feedback for the participants, which was based on the aforementioned rubric but included spaces per element to provide comments. (See *Appendix D*)
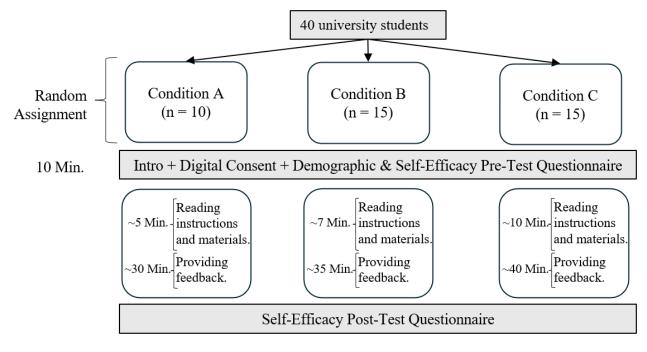
3.3.5 Self-Efficacy Questionnaire

Given the pre-post-test design, participants were presented with one questionnaire, which they had to complete twice. The questionnaire contained an introductory section, informed consent, demographics, and five items to measure self-efficacy. The answer format was a 5-step Likert scale; 1:"strongly disagree", 5:"strongly agree". The items were adapted from the General Academic Self-Efficacy Scale (GASE) (see *Appendix E* for the original and the adapted version) used in educational research studies where it has been deemed valid and reliable for measuring academic self-efficacy. More specifically, the internal consistency of the original GASE questionnaire was assessed using Cronbach's alpha, with an overall Cronbach's alpha coefficient of .81 (Akanni & Oduaran, 2018), indicating good internal consistency. The adaptations replaced the given statement with the context of peer feedback. For example, the first item (i.e., GASE_1), "I generally manage to solve difficult academic problems if I try hard enough", became "I generally manage to provide feedback to my peer if I try hard enough".

3.4 Procedure

To maintain anonymity, each student was given a code, and informed consent was obtained from all participants before the study began. They were informed that their results would be used in scientific research and that they could request their data to be excluded. Additionally, ethical approval was received from the social sciences ethics committee of the associated university. Furthermore, the following conditions were carried out individually, as outlined in Figure 1.

Figure 1

Procedure per condition

3.4.1 Condition A

Being the most common practice, the rubric-only condition was the control condition. In this condition, participants were only provided with instructions and a rubric to provide feedback on the argumentative essay.

3.4.2 Condition B

This condition consists of duplicate materials from the control group, with the addition of a high-quality exemplar of an argumentative essay. The students are provided with both materials synchronised and provide feedback using both in any given order.

3.4.3 Condition C

This condition adds complexity and focuses on deconstructing criteria preceding reading the exemplar and providing feedback. In this condition, the instructions were longer and provided clear steps to deconstruct the criteria, with space for notes, before analysing the exemplar and, lastly, providing feedback. It is important to note that in this condition, students were asked to use their deconstruction of the criteria and trust it to provide feedback (unlike the other conditions).

3.5 Data Analysis Plan

To assess the effectiveness of how the different feedback approaches—(1) using rubrics alone, (2) using exemplars with teacher-provided rubrics, or (3) deconstructing criteria before analysing exemplars—affected the dependent variables, feedback quality and self-efficacy, different analyses were conducted.

Descriptive statistics were calculated to present an overview of the demographics in each group, including age, gender, and nationality. Moreover, feedback quality was analysed through quantitative methods, i.e. content analysis, while self-efficacy was analysed using quantitative methods, i.e. inferential statistics. This will be further elaborated on in the following subsections.

Moreover, before the statistical tests described in the sections *Feedback Quality* and *Self-Efficacy*, the Kolmogorov-Smirnov and Shapiro-Wilk tests of normality were conducted to choose which statistical analyses were most appropriate.

3.5.1 Feedback Quality

To investigate the effectiveness of feedback practices, the objective measure of feedback quality was used. From the collected feedback templates, each response was coded by element (7 elements in total, with points from 0-2) to measure and compare the quality. The coding was performed by two coders (i.e., the author and a trained coder). To ensure reliability in the coding process, the coder was trained on the coding rubric, and then each coder independently coded and compared all of the data (i.e., 40 feedback sheets). Disagreements were resolved through discussion until a consensus was reached. Furthermore, the quality was quantified and compared between groups with a one-way ANOVA test to compare the mean differences between groups, providing a numerical dimension.

3.5.2 Self-Efficacy

Due to the pre-post-test nature of the design, several analyses can be done. Firstly, a paired-sample t-test was used to examine the progress of self-efficacy from the pre-test to the post-test moment for Conditions A and B, as the data was normally distributed and, therefore, met the requirements for parametric testing. However, Condition C was analysed using the equivalent non-parametric test, i.e. Wilcoxon's signed rank test, due to non-normal distribution. Furthermore, a Kruskal Wallis H test was conducted to compare the pre-test scores between the conditions and observe the level of self-efficacy among participants. This was then repeated for the post-test condition. This provided a balanced overview of the data collected and allowed drawing conclusions.

4. Results

4.1 Descriptive Statistics

Before discussing the effects of various supports on the quality of feedback provided and self-efficacy, it is essential to present the descriptive statistics for the primary variables involved in the study. For each participant, the average score for self-efficacy (with scores from 1 to 5 from the questionnaire) and feedback quality (with scores from 1-14 from the coding scheme) were used to provide an overview of the data. *Table 2* provides an overview of the means and standard deviations for feedback quality and self-efficacy scores across the various conditions.

Table 2

Descriptive Statistics Overview

	Condition	*N*	*M*	*SD*
Self-Efficacy Pre-Test Scores	A	10	4.08	.391
	B	15	3.99	.417
	C	15	3.61	.769
Self-Efficacy Post-Test Scores	A	10	3.92	.719
	B	15	4.04	.314
	C	15	3.85	.325
Feedback Quality Scores	A	10	10.90	2.300
	B	15	10.07	1.692
	C	15	11.13	1.821

4.2 The Effect of Various Support on the Quality of Feedback Provided

Preceding the analyses, the author and trained coder compared scores. According to Landis and Koch (1977), the interrater agreement was substantial (Cohen's Kappa = .7333). Additionally, disagreements were resolved through discussion until a consensus was reached.

The data was then tested for normality per group. The results of the Kolmogorov-Smirnov and Shapiro-Wilk test showed that Condition A did not differ significantly from a normal distribution. More precisely, the Shapiro-Wilk test yielded a statistic of $W(10) = .951$ with $p = .731$. For Condition B, the tests indicated the scores are also not significantly different from a

normal distribution, with a Shapiro-Wilk test statistic of $W(15) = .936$ with $p = .337$. Lastly, both tests for Condition C indicated non-significant differences in scores to a normal distribution. Thus, the Shapiro-Wilk test yielded a statistic of $W(15) = .897$, with $p = .086$. Given that all the corresponding p-values are larger than the conventional alpha level of .05, the null hypothesis that the differences are normally distributed is accepted. See *Table 2* for a summary of the normality tests conducted per condition.

Given that the data was normally distributed, a one-way between-subjects ANOVA test was conducted to compare the effect of the various feedback approaches on feedback quality for all conditions. The results showed no significant effect between the feedback quality per group at the alpha level, $F(2, 37) = 1.17$, $p = .322$. See *Table 3* for the full summary of the test results. Moreover, the p-value indicates that any differences between the groups are likely due to random variation rather than group effect.

Table 2

Summary of Normality Test Results per Condition

	Condition	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	p	W	df	p
Self-Efficacy	A	.281	10	.024	.858	10	.072
Pre-Test Scores	B	.120	15	.200[*]	.928	15	.253
	C	.226	15	.037	.753	15	<.001
Self-Efficacy	A	.156	10	.200[*]	.898	10	.206
Post-Test Scores	B	.217	15	.055	.909	15	.133
	C	.190	15	.148	.894	15	.078

Note. *. This is a lower bound of the true significance. [a]. Lilliefors Significance Correction.

Table 3

ANOVA Results for Feedback Quality Scores

Group	SS	df	MS	F	P-value	F crit
Between Groups	9.208	2	4.604	1.170	.322	3.252
Within Groups	145.567	37	3.934			
Total	154.775	39				

4.3 The Effect of Various Supports on Self-Efficacy for Providing Peer-Feedback

4.3.1 Pre-test Comparison

Due to the normality criteria being violated by Condition C, a Kruskal-Wallis H test was conducted to determine if there were differences in self-efficacy scores among the three conditions (A, B, and C). The results indicated that the distribution of self-efficacy scores was not significantly different across the conditions, χ^2 (2, $N = 40$) $= 3.391, p = .183$. Pairwise comparisons using the Bonferroni correction revealed no statistically significant differences between any pairs of conditions; see *Table 4* for a summary of these results. Therefore, the null hypothesis is accepted, meaning that the distribution of self-efficacy scores is not the same across the different conditions.

Table 4

Pairwise Comparison using Bonferroni Correction Results

Conditions	Mean Difference	SE	T	*df*	*p*
A vs B	.107	4.214	1.471	9	.424
A vs C	.400	4.711	1.649	14	.298
B vs C	.187	4.711	.333	14	1.000

4.3.2 Pre-test to Post-test Comparison

The results of the Kolmogorov-Smirnov and Shapiro-Wilk normality tests from pre-test to post-test indicated that the differences between scores for Conditions A and B were normally distributed. However, Condition C violated the normality criteria. See *Table 2* for the summary of the normality test results.

For Condition A, a paired samples t-test was conducted to evaluate the impact of the intervention on self-efficacy scores in Condition A. There was no significant difference in self-efficacy scores between the pre-test ($M = 4.08, SD = .391$) and the post-test ($M = 3.92, SD = .719$); $t(9) = .760, p = .466$, 95% CI $[-0.316, 0.636]$.

Since Condition B is also considered normally distributed, a paired-sample t-test was conducted to evaluate the impact of the intervention on self-efficacy scores in Condition B. There was no significant difference found in self-efficacy scores between the pre-test ($M = 3.99, SD = .417$) and the post-test ($M = 4.04, SD = .314$); $t(14) = -.521, p = .610$, 95% CI $[-0.273, 0.166]$.

Lastly, for Condition C, a Wilcoxon signed-rank test was conducted to determine whether there was a statistically significant difference in self-efficacy scores before and after the intervention for Condition C (i.e., a non-parametric equivalent of a paired-sample t-test due to not meeting the normality criteria). The results of the test indicated that there was no significant difference between the pre-test ($M = 3.61$, $SD = .769$) and post-test ($M = 3.85$, $SD = .325$) scores, $W = 41.000$, $Z = .732$, $p = .464$. Therefore, the null hypothesis that the median difference is zero was retained.

Since there were no significant differences from the pre-test to the post-test for all conditions, the post-test scores of self-efficacy were not compared for significant differences.

5. Discussion

5.1 Summary and Interpretation of Results

The goal of the present study was to evaluate the effectiveness of three different peer feedback approaches—using rubrics alone, using exemplars with teacher-provided rubrics, and deconstructing criteria before analysing exemplars—on the quality of feedback provided by university students, as well as the relation to their self-efficacy in providing peer feedback. The findings revealed that none of the approaches showed significant differences in the quality of feedback provided by the students. However, a general increase in self-efficacy was found, suggesting that engagement in peer feedback activities positively influences the confidence in students' abilities to provide feedback.

Contrary to previous studies, this research did not find significant improvements in the quality of peer feedback through the use of rubrics, exemplars with rubrics, or deconstructing criteria before analysing exemplars. Additionally, the study deviated from the benefits described by Carless et al. (2018) of combining rubrics with exemplars. While Carless et al. (2018) found exemplars could improve students' understanding of assignment expectations and quality, the findings align with Latifi et al. (2023), who reported no significant improvement in feedback efficacy with exemplars. A potential reason for this discrepancy might be the differences in the implementation of exemplars or the circumstances of said feedback activities.

Moving on to self-efficacy, despite the lack of significant improvements in self-efficacy among all groups, the study highlights the general increase in self-efficacy from engagement in peer feedback activities. This result is partially consistent with other studies that show students' confidence in their skills can be raised through participation in peer feedback processes (Er et al., 2021; Wei et al., 2024). Furthermore, the improvements in self-efficacy align with the social constructivist model, emphasising active engagement as the main contributor to the learning process (Rust et al., 2005).

5.2 Limitations

Starting with the limitations, one of the main drawbacks of this study is the possible lack of scaffolding and directions for the various conditions in terms of the approach to giving feedback they should take. According to research, providing precise, comprehensive instructions is essential to getting excellent feedback (Carless et al., 2018; Sadler, 1989). It is possible that the guidelines in this study were not clear enough for students to completely understand and use the new feedback

mechanisms. This limitation could explain the lack of significant differences before and after the intervention in the quality of the feedback between conditions and self-efficacy by not fully emerging in the situation and task at hand.

This leads to the following limitation of the short duration of the intervention, which may have been insufficient for the students to internalise and effectively apply the new feedback strategies described. Especially for the group that was deconstructing criteria, it was abstract and may not have been fully understood by students. Previous studies emphasised the need for practice and engagement in mastering new skills, including providing feedback, which was not integrated into this study's design (To et al., 2021). Moreover, it is difficult to know to what degree students adhered to the instructions based on their engagement in the study. This limited timeframe restricted the students' ability to integrate the various supports completely, thereby diminishing the impact on feedback quality as well as the benefit of improved self-efficacy. This is closely linked to the diversity of the sample, considering the prior experiences of students in their different studies. Due to that, some students have undergone entire components and courses in their study, while others have had minimal exposure to peer feedback; therefore, the practice needed to master giving feedback may be higher in some students. Prior training has a substantial impact on a student's ability to provide high-quality feedback (Wei et al., 2024).

Towards the contextual rather than methodological aspect, the non-natural classroom environment may not reflect the formal and interactive nature of a typical classroom setting, given that friends and familiar peers surround the students. The artificial environment may have constrained the natural interactions of the classroom, as well as deviate from the literature based on natural classroom environments. Furthermore, on the theme of familiarity between peers and the researcher, measuring self-efficacy with self-reports may be prone to social desirability bias. There may also be an influence by peers present, given that the questionnaires were potentially visible to those sitting around.

Additionally, deviating from the approaches used in previous literature, the feedback-giving approach was individual rather than dialogue-based. The feedback tasks were completed fully individually and in silence, so people did not affect each other. Studies indicate that dialogic feedback procedures, in which students discuss and exchange feedback among themselves in groups, improve comprehension and implementation of feedback (Sadler, 1989; Topping, 1998). The absence of these interactions between students may have limited the potential for deeper

learning and higher-order thinking skills engagement, which in turn would increase the feedback quality and self-efficacy of students (Er et al., 2021; Kerman et al., 2023). Additionally, Wei et al.'s (2024) qualitative findings indicated that sharing feedback with group members helped students learn what comments and suggestions could be given to their peers, with results of low-efficacy students improving their confidence in giving feedback and having more knowledge for giving feedback. Although this decision was made to conduct the experiment in one session within a single classroom, it represents a deliberate design choice rather than a limitation of the study that has to be considered when comparing and interpreting findings in the context of previous literature. To reiterate, this draws back to the limited scaffolding and instruction in the groups because all the instructions were only given in writing, so the different groups would not be confused by each other, with the opportunity to ask questions.

Lastly, even though previously observed in research by Wei et al. (2024) and Vattøy & Gamlem (2023), due to the limited sample size, it was not possible to identify or systematically assign peers based on their level of self-efficacy. Dividing the sample size further than the three groups could be problematic in terms of statistical analyses. The possibility of adding this layer with a larger sample size could have provided valuable insights towards the understanding of self-efficacy in the academic context as well as the relevance to the social constructivist frameworks of learning.

5.3 Implications for Future Research and Practice

Moving on to recommendations for future research, the current study's findings provide several opportunities for further research to build upon. An insightful path to take towards building on this research would be, given a larger sample, not only comparing self-efficacy between the pre and the post-condition but also categorising between low and high self-efficacy and its effect on the feedback quality. Additionally, the same study design but using purposeful (i.e. not random) matching of students based on self-efficacy further enhances the benefits of providing feedback in terms of learning for both parties. Going back to the foundation of this study, To et al. (2021) recommended active approaches to feedback that should still be further developed in order to test different circumstances in which these approaches may work, given that this study did not find significant results. Theoretically, the more interactive and participatory approaches should be effective in increasing feedback quality; however, these ideas and theoretical backgrounds may need creative implementations in practice.

Even though this study was not able to contribute significant results to the learning gap of deconstructing criteria, there are several other ways this study could be replicated and built upon, including the more common dialogue-based approach, which may have a greater effect than initially thought. It may also hold great potential to test these approaches with different age groups since there is a possibility that the approaches are not fitting for university students. In contrast, an increase in self-efficacy in younger students may be more attainable. Additionally, peer feedback may be enhanced with the use of technology, such as the use of online environments or the facilitation of peer feedback given with appropriate software. Moreover, given that the research contradicted prior research, it is essential to question the previous results and replicate studies to enrich our understanding, perhaps with some changes in nuances of implementation and context-specific factors. Lastly, investigating the long-term effects of peer feedback on self-efficacy and feedback quality could shed light on the sustained benefits of these practices. Continuous exploration and innovation in peer feedback strategies could largely benefit the educational community and student development.

Furthermore, despite its limitations, the study contributed to a further understanding of peer feedback practices among university students. It highlights the complexity of improving feedback quality and the positive impact of peer feedback activities on students' self-efficacy. By comparing different approaches, the study provides valuable insights for educators on how to design effective feedback interventions, as well as researchers on areas of research that need further exploration and investigation in order to potentially reach a consensus on the most effective feedback practices in the future. Moreover, the findings underscore the importance of active engagement, suggesting that merely providing rubrics or exemplars may not be enough to enhance feedback quality or engagement with the materials.

Lastly, this study's findings have practical implications for educational practices and the learning community as a whole. Educators should nevertheless consider integrating peer feedback activities to boost students' self-efficacy. While the study did not find significant differences in feedback quality or self-efficacy, this is a matter of further research and tweaking of the procedures rather than removing the practice as a valuable pedagogical tool. To maximise its benefits, educators should provide clear instructions, sufficient scaffolding, and opportunities for students to engage in meaningful dialogue about feedback.

6. Conclusions

In summary, this study contributes to the ongoing discourse on peer feedback in higher education by examining the effectiveness of the various approaches—using rubrics alone, combining exemplars with rubrics, and deconstructing criteria before analysing exemplars—and their impact on feedback quality and self-efficacy. The findings revealed no significant differences in feedback quality or self-efficacy across the conditions, challenging the notion that rubrics, exemplars, or deconstructing criteria alone can significantly enhance feedback practices. This underscores the need for further research recommendations such as the long-term effects of peer feedback, the impact of dialogue-based feedback approaches, and the integration of technology to refine the approaches and better support student learning, as well as create a strong framework for educators to base feedback activities on.

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Appendix A. Argumentative Essay

Introduction:

The debate between job rotation and job specialisation is important in today's workplace. Job rotation means moving employees to different roles to increase their skills, while job specialisation focuses on making employees experts in a single task. This essay will compare these two methods by looking at skill variety, task identity, and task significance. Job rotation seems to be better for keeping employees motivated and satisfied.

Body:

Job rotation gives employees more skills compared to job specialisation. Moving employees through different roles keeps work interesting and prevents boredom. Specialization can lead to repetitive tasks that make employees feel bored and burnt out. Studies show that employees who do different tasks are happier and more motivated.

Job rotation helps employees see how their work impacts the whole company. This makes them feel more important and connected to the company's goals. Specialization can make employees focus only on their small part, making them feel less significant. When employees understand the bigger picture, they are more motivated.

Some people think job specialization is better because it makes employees more efficient and expert at their tasks. Specialization can lead to fewer mistakes and higher productivity. It also allows for easier training and clear career paths, which some employees prefer for stability. These points are true, but they miss the long-term effects on motivation. Doing the same tasks repeatedly can make employees disengaged. Also, today's workplace needs flexible skills that job rotation provides. While specialization might help in the short term, job rotation helps in the long term by keeping employees motivated and adaptable.

Conclusion:

In conclusion, job rotation is better than job specialization for motivating employees. It provides more skills, and increases the sense of importance. Although specialization has benefits like efficiency and expertise, it often fails to keep employees motivated over time. Companies should use job rotation to maintain employee satisfaction and motivation.

Appendix B. Rubric

Argumentative Essay Component	Feedback Prompts per Component
Introduction	To what extent did your peer present a clear introduction on the topic in terms of explaining the issue at hand? What are your suggestions? Please explain.
Claim	To what extent did your peer present a clear position on the topic in favour or against the topic? What are your suggestions? Please explain.
Arguments for the claim	To what extent did your peer provide arguments in favour of her/his own position on the topic? What are your suggestions? Please explain.
Support for arguments	To what extent did your peer provide support (facts, evidence, examples, figures, experiences, etc.) for arguments in favour of their position? What are your suggestions? Please explain.
Response to counter-argument	To what extent did your peer respond (using justified arguments) to the counterargument against her/his position? What are your suggestions? Please explain.
Conclusion	To what extent did your peer come to a conclusion (restating her/his position)? What are your suggestions? Please explain.

Appendix C. Argumentative Essay Exemplar

The plant-based diet should be the default diet

Introduction

People are increasingly aware of the detrimental effects of diet on the climate[1]. Diets that include animal products especially have detrimental effects on climate change[2]. The animal agriculture industry is an incredibly wasteful industry which contributes to climate change, while there is no nutritional necessity for this industry[3,4,11]. Therefore, I am of the opinion that people need to switch to a plant-based diet.

Arguments

Firstly, the animal agriculture industry is one of the main contributors to climate change. Some 26% of all greenhouse gas emissions are connected to food production[3]. One of the most powerful greenhouse gasses is methane. Methane is produced by cows and causes 28 times more global warming than CO_2 per kilogram emitted[4]. Besides this large carbon footprint, the livestock industry requires immense amounts of scarce resources such as land and water. Moreover, animal agriculture has more devastating effects on our earth. For instance, it is the primary driver of deforestation and species extinction[5]. Despite this detrimental impact, industrialization of this industry has intensified in the past decades. Unfortunately, there is no such thing as a climate-neutral diet. However, some diets such as a plant-based diet are more climate friendly than other diets. Consumers can contribute to reducing climate change via their diet multiple times a day by swapping out meat for plant-based alternatives. For instance, opting for vegetarian minced meat instead of beef in a lasagna that serves four people saves 4.1 kilograms of CO_2 [6].

Secondly, the animal agriculture industry is incredibly wasteful as there is an immense discrepancy between resource input and resource output. To illustrate, 37 calories of plants are needed to produce just one calorie of beef[7]. Therefore, filtering our food through an animal's body is vastly inefficient. This inefficiency is incomprehensible and unjustifiable as it is estimated that between 720 and 811 million people were affected by hunger in 2020[8]. Less than half of the crops that are produced are consumed directly by people[9]. If we stopped filtering our nutrients through an animal's body and produced plants instead of animal products in the United States alone, an extra 350 million people could be fed[10].

Counterargument

People often argue that eating meat is and should remain a personal choice that should be respected[14]. However, this "personal choice" impacts the lives of many. The will of the animal to live is not being taken into consideration and the lives of many people on earth are affected by the animal agriculture industry. The lives of other people are not just affected by this industry indirectly via climate change but also directly by, for instance, driving antibiotic resistance. This problem will claim more lives than cancer by 2050[12]. Animal agriculture also greatly exacerbates the risk of creating infectious zoonotic diseases[13]. Animal farming has triggered multiple pandemics such as the 2009 swine flu and possibly COVID-19, that may have come from a wet market in Asia[13]. These types of virus outbreaks affect people all across the globe and they are occurring at an increasingly frequent rate[12]. Therefore, the choice to eat meat is not so personal after all.

Conclusion

The animal agriculture industry has a high carbon footprint with a large discrepancy between resource input and resource output. Considering that the Academy of Nutrition and Dietetics stated that plant-based diets are nutritionally adequate, there is no nutritional necessity to eat meat. Therefore, this discrepancy is unjustifiable. Whilst plant-based diets are not inherently sustainable, they are generally more sustainable than other diets. Therefore, people should adopt plant-based diets. A part of the solution to climate change is on our plates.

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Appendix D. Feedback Template

Argumentative Essay Component	Write your feedback in the boxes below:
Introduction	
Claim	
Arguments for the claim	
Support for arguments	
Response to counter-argument	
Conclusion	

Appendix E. Self-Efficacy Scales

Table E1. General Academic Self-Efficacy Scale (GASE)

Item Number	Item
GASE_1	I generally manage to solve difficult academic problems if I try hard enough.
GASE_2	I know I can stick to my aims and accomplish my goals in my field of study.
GASE_3	I will remain calm in my exam because I know I will have the knowledge to solve the problems.
GASE_4	I know I can pass the exam if I put in enough work during the semester.
GASE-5	The motto 'if other people can, I can too' applies to me when it comes to my field of study.

Table E2. Adapted General Academic Self-Efficacy Scale (GASE)

Item Number	Item
GASE_1	I am confident that I can provide constructive feedback on my peers' argumentative essays if I try hard enough.
GASE_2	I know I can achieve the goal of enhancing my peers' argumentative essays by giving them feedback.
GASE_3	I will remain calm while reviewing my peers' argumentative essays because I trust in my ability to offer valuable insights.
GASE_4	I am confident that my feedback can significantly improve my peers' essays, provided I invest enough effort in understanding their arguments.
GASE-5	The motto "If others can provide effective feedback, I can too" applies to me when it comes to critiquing argumentative essays.