

## CHAPTER 23

# Formative Feedback in Writing

## *A Scoping Review*

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Formative assessment is a pedagogical framework with the primary aim of fostering student engagement and promoting effective learning outcomes (Black & Wiliam, 2009). One of its fundamental components is feedback, which plays a pivotal role in facilitating the learning process. Essentially, formative assessment is designed not merely to gauge student performance, but to promote students' learning and provide valuable insights that educators can use to support and adapt their teaching methods (Bennett, 2011; Black & Wiliam, 1998). This paradigm in educational assessment emphasizes the dynamic relationship between teaching and learning and the critical role that feedback plays in shaping educational outcomes (Black et al., 2003).

Although the early discourse on formative assessment primarily focused on teachers' roles in collecting and utilizing information to inform their instruction, more recent developments have led to a reconceptualization of formative assessment as a social and collaborative endeavor closely aligned with the learning process. The emphasis has shifted toward teachers and students working in partnerships to enhance the overall learning experience (Fluckiger et al., 2010; Krishnan et al., 2021). Realizing the full potential of formative assessment requires that educa-

tors help students to understand the learning objectives and provide opportunities for them to receive feedback on their progress toward these goals. To this end, students' understanding of performance expectations, the criteria for success, and strategies for improvement are directly linked to the instruction and feedback they receive (Lipnevich & Smith, 2018, 2022). Effective feedback not only assists students in evaluating their current status, but also guides them on their path forward, clarifying the steps required to advance (Irwin & Reames, 2018).

As authors of the many chapters of this volume have noted, writing is an essential skill for both academic and professional success, and feedback is a critical tool for the development of this ability (Biber et al., 2011). In the context of writing, feedback serves a multitude of important functions ranging from discerning their readers' needs to monitoring their own progress and growth (Graham, 2018). In this chapter, we delve into the role of feedback on writing using the educational framework of formative assessment. To accomplish this task, we conducted a scoping review of research on formative feedback in the context of writing from 2015 until 2023. The decision to review literature over this period was based on the rationale of encompassing the time frame

since the last significant meta-analyses in the field (Graham et al., 2015). The selected time frame allows for an up-to-date synthesis of research linking feedback to writing improvements, thereby providing a balanced and current perspective on feedback and its links to improvement in writing. We also review methodological approaches used by researchers in their investigations.

### **Instructional Feedback and Writing: Models and Meta-Analyses**

#### **Models**

Graham (2018) defined feedback in writing as “information provided by another person, group of people, agency, machine, self, or experience that allows a writer, one learning to write, or a writing teacher/mentor to compare some aspect of performance to an expected, desired, or idealized performance” (pp. 145–146). To be effective in fostering the development of writing, feedback must possess specific characteristics and must be delivered in a context that allows for feedback utilization (Lipnevich & Smith, 2022; Winstone et al., 2017). Due to the inherent complexity of the skill, the purposes of instructional feedback are varied and multifaceted and can encompass a wide array of aspects, including but not limited to supporting the learning, retention, and application of new writing skills and strategies; assessing current performance levels; enhancing the quality of writing and encouraging critical thinking; revealing reader reactions and the practical use of written information (Graham, 2018; MacArthur, 2016; Rijlaarsdam et al., 2014). With the numerous functions and purposes that feedback on writing can serve, it is important to consider different theoretical models that frame the research and application of feedback. However, it is beyond the scope of the current chapter to review all the models, so we would like to direct the reader to a recent synthesis of feedback models and typologies across various academic domains (Lipnevich & Panadero, 2021; Panadero & Lipnevich, 2022), and we will focus on two (Hattie & Timperley, 2007; Lipnevich & Smith, 2022).

First, as an illustration of the practical application of feedback models to writing, we consider the work of Hattie and Timperley

(2007), which has now achieved classical status. Applying their insights to the domain of writing, instructional feedback manifests across several discernible categories. These categories encompass feedback pertaining to the task or final product, feedback on the processes employed during the task, feedback on self-regulation, and, finally, person-level feedback. Feedback on the task or product can encompass comments about content quality, grammatical correctness, or the correct execution of newly learned writing strategies. Process feedback mainly involves guidance on utilizing processes essential for creating text, such as goal setting, planning, drafting, revising, and editing. Self-regulation feedback focuses on boosting commitment, control, and confidence in writing, whereas personal feedback might include praise or acknowledgment of personal qualities. Additionally, feedback can extend to influence writers’ emotions, personality traits, audience considerations, and the social context within which writing takes place (Graham, 2018).

Second, our model of student–feedback interaction (Lipnevich & Smith, 2022; Lipnevich et al., 2016) may also be useful when considering feedback in writing. According to it, the process of feedback takes place within a specific context, with writing being one of the domains. The feedback originates from a source that generates it for the learner’s consideration. The source can be the teacher, peer, or generative AI, for example. The feedback message that is provided can be described through its tone, timing, level of detail, or comprehensibility, among other factors. The learner comes into the feedback exchange with their own personality, expectations, motivation, perceived writing self-efficacy, or their general receptivity to feedback (Lipnevich & Lopera-Oquendo, 2022; Sloan, 2017; Whitelock et al., 2017), and these characteristics would affect the way feedback is approached. The message then gets processed, and cognitive, emotional, and behavioral processes interact with each other, culminating in a form of self-feedback that guides subsequent actions. This response has the potential to lead to improved performance on the immediate task, the transfer of knowledge and skill gains to other tasks, or more long-term learning. These represent the various actions, conse-

quences, and overall growth in the learners' performance or in the learners themselves. Conversely, in instances where feedback is of suboptimal quality or remains underutilized by the learner, the prospect for improvement diminishes, and there is a potential risk of decreasing the quality of writing (Lipnevich, Eßer, et al., 2023; Patchan & Schunn, 2015). In sum, these models may help researchers to understand the dynamics of feedback in writing, providing valuable insights that can aid in enhancing instructional strategies, refining assessment practices, and ultimately fostering more effective learning environments.

### Meta-Analyses

When reviewing studies on formative feedback in the domain of writing, it would be remiss of us not to mention existing syntheses of research. There are meta-analyses that examine the effects of formative feedback on writing outcomes, and they consistently indicate that feedback may be highly useful in improving writing. For instance, Graham et al. (2015) conducted a meta-analysis to examine the effectiveness of formative assessment in the context of writing instruction in the K–8 context. Their findings, based on the calculation of 27 effect sizes, suggested that ongoing feedback and assessment during the writing process can significantly improve students' writing performance regardless of its source (i.e., teacher, peer, electronic). Similarly, in an earlier meta-analysis spanning all educational levels, Kingston and Nash (2011) reviewed 13 studies and concluded that in English language arts, formative assessment seemed more effective, with an estimated effect size of 0.32, compared to 0.17 in mathematics and 0.09 in science.

In more recent meta-analyses, Graham et al. (2023) reviewed various instructional practices frequently employed in writing instruction in grades 6–12. Feedback was one of the most common writing interventions identified among the 357 studies they included, being present in 13% of them. They found an average effect size of 0.27 for feedback interventions from teachers, peers, computer, and self. Scherer et al. (2024) also indicated overall positive effects of surface-level and deep-level feedback in fostering learners' writing skills. Similarly, in recent

meta-analyses that focused on feedback from a single specific source, meaningful effect sizes were also observed. For instance, Zhai and Ma (2023) found an effect size of 0.399 of automated writing evaluation on the writing performance of native English speakers. Huisman, Saab, Van den Broek, et al. (2018) found that higher education students who engaged in peer feedback activities improved their writing quality more than participants in no-feedback conditions ( $g = 0.91$ ). Thus, feedback seems to work and its effects appear particularly worthy of consideration for the domain of writing development (see also Graham, Chapter 11, this volume, on evidence-based writing practices).

In this chapter, we review studies that have focused on formative feedback in the domain of writing after Graham et al.'s comprehensive meta-analyses (2015). Our approach was not confined to the constraints of a specific meta-analytic methodology, allowing us to expand our inclusion criteria to encompass diverse methodologies and populations.

### Methodology

It is not common for handbook chapters to include sections on methodology. However, what started as a more traditional review ended up being a rather systematic summary of research following the PRISMA (preferred reporting items for systematic reviews and meta-analyses) protocol. We hope the readers will appreciate our notes on the process, as much as they may on the outcomes of this synthesis.

First and foremost, we limited our search to the years 2015–2023. We made this decision after considering the comprehensive chapter on feedback and writing (Graham, 2018) and the aforementioned meta-analysis published in 2015 (Graham et al., 2015). In addition to this time frame, we adopted the following criteria for eligibility for our screening process:

- Criterion 1: Quantitative, qualitative, and mixed-methods studies that focused on feedback and its links to students' performances in writing
- Criterion 2: Studies conducted in a formal academic context (i.e., students from kindergarten to tertiary levels)

- Criterion 3: Student performance in writing as the dependent variable in the study
- Criterion 4: Studies written in English
- Criterion 5: Studies that focused on writing in the context of first-language learning
- Criterion 6: Studies that involved typically developing learners (not special education)

### Information Sources and Search Strategy

We carried out the literature search in the following databases: PsychINFO (White literature), Google Scholar (Grey literature) using Harzing Publish or Perish, and Web of Science (Grey literature). In both Web of Science and PsychINFO, we utilized the following structure for the search: (*feedback\** OR *“formative assessment”* OR *comment\**) AND (*writing\** OR *writing task\** OR *essay* OR *“writing performance”*). In these databases, we conducted the search filtering results by title, abstract, as well as keywords. In Google Scholar, we used Harzing Publish or Perish to filter the 1,000 most relevant references (Kanade & Duffy, 2020). We also included an extra layer of filters in order to exclude studies that focused on writing in the context of second-language learning. The following combination of terms was used for search in Google Scholar: (*feedback* OR *“formative assessment”* OR *comment*) AND (*writing* OR *“writing performance”* OR *“writing task”* OR *essay*) – *l2* – *esl* – *efl* – *“second language.”*

After all references were retrieved, duplicates were excluded using R (R Core Team, 2020) and Zotero. In the initial screening phase, titles and abstracts were examined through ASReview (ASReview LAB v1.2.1), an open-source software that uses machine learning techniques to rank studies based on user decisions regarding the (ir)relevance of screened articles. The stopping criteria were set at (1) coverage of at least 5% of the total number of articles and (2) identification of 50 consecutive irrelevant studies. This phase involved screening 1,101 references (11.32%) to reach the established stopping point. Subsequently, all full texts of the selected studies were screened, and 153 met our criteria for inclusion in this review. The search process is detailed in the PRISMA flowchart (Figure 23.1).

### Results

Out of the 153 studies included in this review, 26 were classified as literature reviews, meta-analyses, and book chapters. The 127 empirical studies and dissertations were coded into the following categories: (1) sample size; (2) participants' educational levels (e.g., primary, secondary, tertiary); (3) participants' age (e.g., mean or range); (4) participants' gender (e.g., percentage of women); (5) method used (e.g., experimental manipulation, interview, think-aloud); (6) country of data collection; (7) source(s) of feedback (e.g., teacher, peer, automated); (8) domain in writing (e.g., writing fluency, persuasive essays, narrative); (9) research questions or hypothesis; and (10) findings. Most of our sources were coded descriptively, except for research questions or hypotheses and findings, which were copied directly from the text. We will present our research findings in two main sections. In the first section, we will discuss the main research findings, whereas in the second section, we will provide an overview of research methods employed in the studies.

### General Overview of Included Studies

First and foremost, it was encouraging to observe the impressive number of studies conducted within an 8-year time frame. These studies covered a wide range of topics related to feedback in writing and were conducted in over 20 countries, with the United States and the Netherlands being the main contributors to this line of research. The majority of these studies focused on tertiary students from a variety of educational disciplines. The distribution of studies according to participants' educational level can be seen in Table 23.1.

Feedback has historically been linked to the interaction between teachers and students. However, we did not identify any studies that attempted to investigate whether providing teacher comments on students' writing tasks would lead to superior performance improvements in revision drafts in comparison to a control group that did not receive any feedback, pointing to the consensus that feedback from the teacher generally works. Instead, results from our review indicated a shift in this practice, with 61 stud-

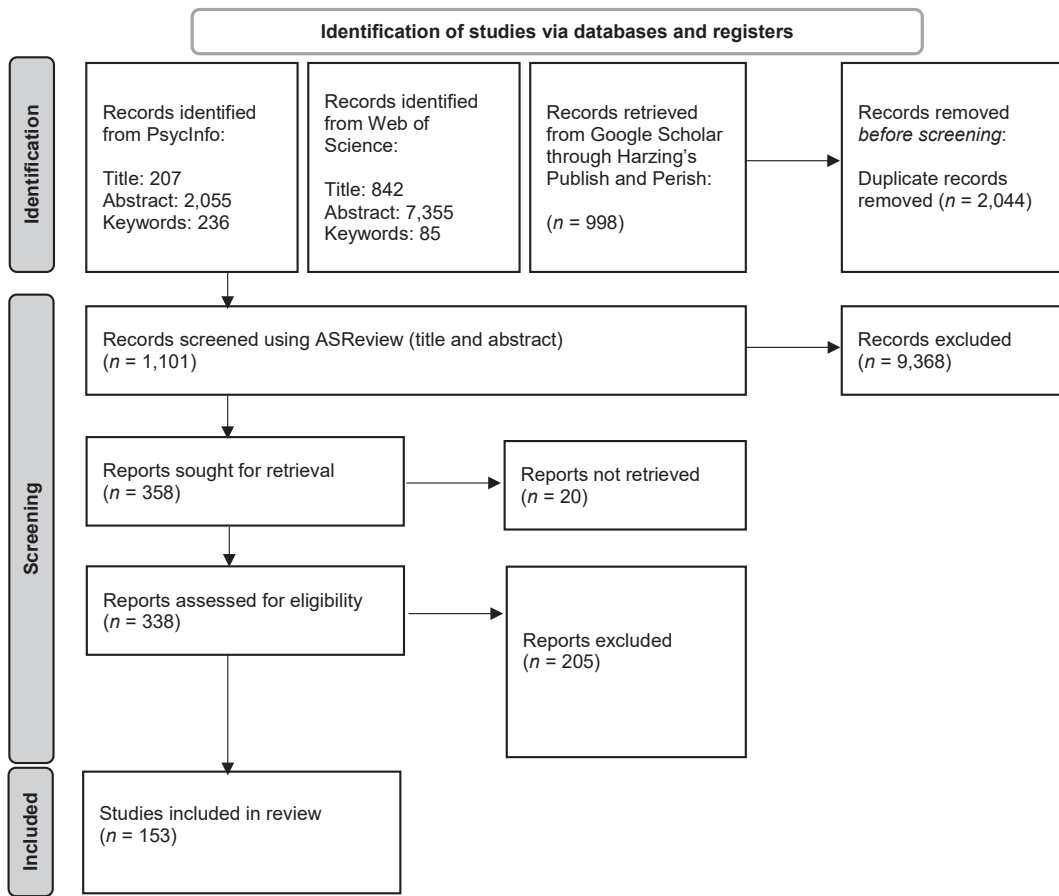


FIGURE 23.1. PRISMA flowchart.

ies reporting investigations of peer feedback and 29 examining the effects of automated feedback on student writing. Other studies focused on comparing multiple agents or having students self-generate feedback based on tools provided to them by the teacher (Lipnevich, Panadero, et al., 2023; Tomazin et al., 2023). The argument that students

need feedback to improve their writing skills and teachers lack sufficient time to provide feedback to students is present in the majority of studies that investigate the potential of these alternative sources (Tomazin et al., 2023; Wu & Schunn, 2021; Zhai & Ma, 2023).

The comparison between teacher and peer feedback has sparked a lot of research interest during the delineated time frame. Results from meta-analysis suggested an average effect size of 0.87 for teacher feedback and 0.57 for peer feedback (Graham et al., 2015). This is different from an earlier meta-analysis conducted by Biber et al. (2011) that showed the effect size for teacher feedback was similar to that reported in Graham, but they found no statistically significant effects of peer feedback. The latter differences can be explained with the types

TABLE 23.1. Number of Studies by Educational Level

Educational level	Number of studies
Primary	34
Secondary	20
Tertiary	78

Note. Some studies used samples from multiple educational levels; hence the totals exceed 127.

of included studies as well as methodological choices when conducting meta-analyses (e.g., no correction for pretest differences in Biber et al., 2011). It is also possible that educators have become more intentional in their instructions for peer feedback exchanges. Hence, the outcomes are quite encouraging.

In the reviewed studies, there was a lot of interest in comparing teacher feedback to self-feedback that students can generate based on educational tools such as annotated exemplars (see Nicol, 2020, for a review on feedback as a comparison mechanism). For instance, Tomazin et al. (2023) conducted a study involving 94 middle school students from Brazil to investigate the effectiveness of annotated exemplars as tools for self-feedback generation, aimed at enhancing persuasive essay revisions. The results indicated overall improvement from the initial to the final draft among participants. Interestingly, there were no statistically significant differences observed among the three experimental groups (exemplars, teacher comments, and the combination of exemplars and teacher comments), suggesting that annotated exemplars proved to be, at the very least, as effective as teacher comments in guiding students through the revision process.

This growing interest in alternative sources of feedback has permeated recent literature within the field of writing, as illustrated in Table 23.2, which summarizes the distribution of studies based on the examined feedback sources. Furthermore, the literature presents valuable insights into the diverse effects of feedback that comes from these different sources on students' writing performance.

**TABLE 23.2. Number of Studies by Source of Feedback**

Source of feedback	Number of studies
Peer	61
Teacher	46
Automated	29
Tools (exemplars, rubrics)	14

*Note.* Some studies used multiple sources; hence the totals exceed 127.

### **Peer Feedback**

Out of the 127 studies we reviewed, 61 studies focused on examining the impact of peer feedback on student writing. This was the largest category when examining the source of feedback and its impact on writing development. Notably, research on peer feedback has seen a significant increase in recent decades (Alqassab et al., 2023; Huisman et al., 2017). Peer feedback, a widely embraced educational intervention, has been shown to allow students to observe diverse writing models, identify issues, and actively participate in the problem-solving process, all of which contribute to their own writing proficiency (Alqassab et al., 2023; Patchan & Schunn, 2015).

To delve deeper into the effects of providing and receiving peer feedback, Huisman et al. (2017) conducted a quasi-experimental study involving a sample of undergraduate students in the Netherlands. Their findings indicated that both providing and receiving feedback led to similar levels of improvement in students' revised essays. Similarly, research involving high school students in the United States demonstrated that learners' performance on revisions positively related to both providing and receiving comments (Wu & Schunn, 2021).

To further disentangle the effects of feedback delivery, Greenberg (2015) investigated the impact of providing peer feedback, particularly when aided by a rubric, on participants' enhancement in their own writing skills. In this study, participants did not have access to the feedback provided by their peers. Instead, the observed improvement in their writing performance was linked to their active engagement with the rubric while providing feedback to a peer.

The potential differential effect of the content of peer feedback has also been investigated. Among college students, peer feedback that contained corrections and suggestions on how to enhance one's work seemed to lead to higher performance outcomes. Kerman et al. (2022) found that peer feedback that was identified as being descriptive or constructive predicted participants' gains in their revision practices of their own argumentative essays. Interestingly, less successful students tended to receive more emotionally supportive messages, while higher

achievers received constructive suggestions for improvement. Cheng et al. (2015) also concluded that corrections led to better performance improvements compared to affective feedback, such as praise. This was one of the few studies that examined an incremental increase in students' marks following a three-round peer review activity. Other studies found no differences among different feedback types (e.g., Sloan, 2017; Valero Haro et al., 2023).

Researchers have also considered varying ways of peer feedback presentation (Latifi & Noroozi, 2021; Noroozi et al., 2016). In a study conducted by Latifi and Noroozi (2021) involving 42 undergraduate students in Iran, the use of scripted question prompts resulted in significantly higher improvements on revised essays compared to a control group receiving unscripted messages. Interestingly, the positive impact of scripted peer feedback surpassed that of peer feedback using an exemplar (Latifi et al., 2023). In terms of pairing students during peer review activities (pairing peers of different or similar levels of ability), Huisman et al. (2017) found no discernible impact of dyad composition on the final version of writing assignments.

These studies collectively demonstrate that peer review is an effective tool with the potential to enhance students' writing performance, supported by detailed recommendations for classroom implementation (Beyer, 2018; Ober & Flores, 2020). These findings underscore the significant potential of peer feedback in skill development, emphasizing its multifaceted nature and impact across diverse student populations and educational contexts. Ongoing exploration in this area holds promise for further insights into the dynamics of peer feedback for improving student writing.

### **Teacher Feedback**

When people think about feedback, they often envision the comments that teachers provide on students' work. Teacher feedback plays a crucial role in students' writing development (Högemann et al., 2021), and students commonly express their preference for feedback from teachers (Van der Kleij & Lipnevich, 2020). Although the primary source of feedback varied in the reviewed

studies, 46 of them investigated the feedback provided by instructors. Interestingly, despite the expected focus on in-person relationships between teachers and students, the majority of the reviewed studies employed electronic forms of feedback delivery (e.g., Grigoryan, 2017; Kiani & Menke, 2015; Lipnevich et al., 2021) as opposed to handwritten comments on the margins of student assignments.

The modes of feedback delivery used by teachers have been a focus of research interests. For example, Grigoryan (2017) investigated whether students taking an online course would increase their writing performance when receiving a combination of audio-visual and text-based commentary when compared to participants receiving written comments only. No statistically significant differences were found in the number of revisions or in the overall quality in the final essay. However, participants in the multimodal feedback group showed higher rates of performance improvement in the categories of audience and purpose. McKeown et al. (2020) also investigated the potential of asynchronous audio feedback to assist fifth graders in revising their persuasive essays and observed a positive effect of this mode of feedback delivery. Similarly, Reed (2019) compared the effects of handwritten teacher comments to teacher feedback delivered via email. This study found a statistically significant positive effect of receiving handwritten comments on participants' writing performance. Additionally, students' preferences for handwritten comments were also reported.

Teacher comments are often accompanied by grades, and Lipnevich et al. (2021) investigated the impact of grades in students' emotional experiences and performance in their revision of essays by comparing those students to a group that received written comments only. Participants who received grades in addition to comments reported more negative emotions than those in the comments-only group. However, grades and negative emotions contributed to higher final essay scores, thus demonstrating the complexity of interactions between feedback, emotions, and performance on a writing task.

The content of teacher feedback represents a rich area of research. Hattie et al. (2021) specifically delved into the hypothesis that

feedback providing guidance on future improvements, referred to as “where to next” feedback, would excel at enhancing students’ writing performance. Through an extensive analysis of student writing samples and their associated feedback, the authors confirmed that “where to next” feedback was remarkably effective in guiding revisions, irrespective of its level of specificity.

Taking a different perspective, Högemann et al. (2021) investigated how students’ varying perceptions of the usefulness of teacher feedback and their actual utilization of the feedback influenced the quality of their writing revisions. The study identified three profiles (high, medium, and low feedback profiles) based on students’ ratings of perceived usefulness and reported use of the feedback. Surprisingly, these profiles did not impact students’ revision processes, as all participants improved their writing, demonstrating a consistent trend toward enhancement irrespective of diverse feedback sources and student perceptions. This underscores the enduring value of feedback as a catalyst for growth in writing performance.

Although teacher feedback may not be the primary focus in the reviewed studies, a multitude of intriguing research has explored modes, content, and mechanisms underlying the effects of feedback on writing. Despite other sources taking precedence, these studies delve into the aspects of how feedback influences the writing process and outcome. These studies significantly contribute to our understanding of the nuanced mechanisms shaping the impact of feedback on student writing.

### ***Automated Feedback***

Recent advancements in artificial intelligence have offered innovative forms of automated assessments and feedback delivery (Olivera-Aguiar et al., 2022; Zhu et al., 2020). This groundbreaking technology has enabled the provision of instantaneous feedback on students’ writing, sparking a surge of research to gauge its effectiveness. However, it’s worth noting that research in the domain of automated writing evaluation is still in its early stages.

A few notable examples are worth mentioning. Zhai and Ma (2023) reported an effect size of  $g = 0.399$  for automated writ-

ing evaluation in enhancing the writing performance of native English speakers. Interestingly, this effect size appeared lower when compared to its impact on the writing development of English as second- or foreign-language learners, where the effect size ranged from  $g = 0.966$  to 1.048. These findings underscore the dynamic nature of automated writing assessment and its varying effects on diverse student populations.

The proliferation of massive open online courses (MOOCs) has introduced a fresh challenge for feedback researchers. The scale and reach of MOOCs make it impractical to provide frequent individualized teacher feedback, and peer feedback may also be complicated. Santamaría Lancho et al. (2018) delved into these challenges, exploring open-ended questions in large courses and MOOCs. They reported their experience with an automatic assessment tool called G-Rubric, which relies on latent semantic analysis. Remarkably, G-Rubric demonstrated its ability to deliver reliable and consistent scoring that aligned closely with tutors’ assessments. Furthermore, students’ writing skills exhibited improvement following the integration of this automated feedback. This study emphasizes the potential of semantic technologies to offer sustainable and effective feedback solutions for the expansive landscape of large courses and MOOCs.

The results of studies that involve automated writing evaluation systems and their effects on performance are not consistent. For example, Wang et al. (2020) examined the impact of feedback from eRevise on the writing improvement of middle school students. Their findings revealed that although most students incorporated the feedback they received, these revisions often failed to yield significant improvements in the overall quality of their work. This pattern of mixed results is consistent with broader research in the field.

In conclusion, studies that explore automated writing evaluation systems show that automated feedback can be a valuable tool in enhancing writing skills, but the nature, the frequency, and the prompts that students and educators can use to request feedback need to be more closely examined. These factors will inevitably affect the extent of students’ revision behaviors and subsequent writing improvements.



### **Educational Tools: Rubrics and Exemplars**

Educational tools, like rubrics and exemplars, have emerged as effective feedback mechanisms in the field of writing, particularly when offered *after* students have produced initial drafts (Lipnevich, Panadero, et al., 2023; Lipnevich et al., 2014). These tools empower students to generate self-feedback, a critical element in the revision process (Nicol, 2020).

In our study comparing rubrics to exemplars, Lipnevich, Panadero, et al. (2023) showed that students who received rubrics after their initial draft had been submitted outperformed their counterparts in the exemplars group, the control group, and the combined condition group (exemplars and rubric). However, we found that after receiving training, both rubrics and exemplars groups did comparably well on their written assignments. In other words, the promising outcomes of this study underscore the importance of providing students with explicit training on how to effectively utilize both rubrics and exemplars for optimal improvement on their written assignments.

The potential of exemplars in providing feedback to high school students on their writing processes has also been explored by Vandermeulen et al. (2023). Using keystroke logging, the researchers tracked participants' writing, reading, source utilization, and revision behaviors. Participants were randomly assigned to one of two conditions: those with access to an exemplar illustrating a process leading to texts of similar quality (position-setting condition), and those with exemplars of processes resulting in superior-quality texts (feed-forward condition). Participants also had access to their previous performances and were encouraged to compare their processes with the given exemplar for revision. Results indicated that the feed-forward process feedback had a significant and positive effect on text quality and supported participants in self-regulating their writing process. This is not surprising as effective self-feedback generation often necessitates comparing one's current performance with external sources of information (Nicol, 2020). Therefore, when using instructional materials to prompt self-feedback generation, researchers and educators should facili-

tate the process by making these comparators explicit.

In summary, despite the great potential of instructional tools, they are currently underutilized in research and practice as sources of self-feedback generation. Preparing rubrics, exemplars, checklists, and concept maps is more efficient than providing individualized teacher comments in students' writing tasks and can lead to comparable performance gains (Tomazin et al., 2023). Therefore, these studies underscore the critical role of educational tools and feedback mechanisms in enhancing students' writing skills. Whether it is through rubrics, exemplars, or structured instruction, these tools play a vital part in guiding students toward improved writing proficiency.

### **Overview of Research Methods**

Table 23.3 presents the distribution of different research methods employed in reviewed studies. Among the various approaches, experimental studies were the most prevalent, with 49 describing controlled experiments to investigate the effects of feedback on writing. Forty-two studies used a single-group design, focusing on writing performance before and after feedback interventions. Quasi-experimental research, involving manipulations of feedback without random assignment, was utilized in 21 studies,

**TABLE 23.3. Methods Used in Empirical Articles and Theses**

Educational level	Number of studies
Experimental	49
Single group pre-post	42
Survey	32
Quasi-Experimental	21
Correlational	10
Interview	9
Written responses	8
Focus Groups	3
Think Aloud	3
Comparative	3
Eye Tracking	3

*Note.* Some studies used multiple methods; hence the totals exceed 127.

whereas correlational research, exploring relationships among variables, was used in 9 studies. Researchers also employed a variety of methods to collect data, such as surveys ( $n = 32$ ), interviews ( $n = 8$ ), focus groups ( $n = 3$ ), and other methods.

It is certainly encouraging to observe a significant number of experimental and quasi-experimental studies conducted in the realm of written feedback research. These methodologies offer valuable insights into the impact and effectiveness of feedback interventions. However, it is worth noting that despite the prevalence of these approaches, there remain certain challenges within the body of research. Many studies continue to grapple with issues related to sample sizes, having as few as eight participants in an experimental study (Steinman, 2017). Furthermore, only a small number of studies report power analysis (e.g., Alitto et al., 2016), and only a few include proper control groups (e.g., Fidalgo et al., 2015; Gilken & Johnson, 2021). Addressing these challenges is crucial for ensuring the robustness and generalizability of findings in this important field of study.

These challenges are certainly not unique to this domain of study. In the realm of educational research in general, randomizing participants can often pose logistical challenges. Hence, entire classes often get assigned to a single experimental condition. Within our review, we have identified a notable methodological concern specifically related to studies employing quasi-experimental designs. Regrettably, some of the studies failed to administer and report pretest measures of student performance (e.g., Reed, 2019) rendering study conclusions difficult to interpret.

Another critical methodological consideration pertains to the process of scoring. Evaluating students' writing assignments is a complex task, often marked by noticeable variability in scores. To mitigate this concern, several reviewed studies have advocated and implemented the involvement of multiple trained graders, alongside the calculation of interrater reliability (Grigoryan, 2017; Kerman et al., 2022; Noroozi et al., 2023; Wu & Schunn, 2021). Despite these recommendations, a majority of studies relied on single graders and coders. It is essen-

tial to reiterate to researchers that depending on a single rater is insufficient to ensure impartial and accurate scoring. This underscores the critical importance of addressing issues related to score reliability and validity to enhance the overall quality of research in the field of written feedback assessment.

In recent years, an increasing number of researchers have opted for online platforms for data collection (e.g., Cheng et al., 2015; Jin et al., 2022; Tomazin et al., 2023), a trend that brings both advantages and challenges. Utilizing technology undoubtedly broadens access to research participants, facilitating the inclusion of more extensive and diverse samples. However, it also introduces a level of uncertainty by diminishing control over external factors that may impact participants' experiences and responses. For instance, in virtual data collection, researchers must carefully assess whether participants receive additional assistance or support in completing their assignments. Such support can originate from various sources, including peers, family members, or AI tools, potentially introducing confounding variables that might complicate the interpretation of results.

Other studies employed eye tracking (Bouwer & Dirkx, 2023), keystroke logging (Vandermeulen et al., 2023), and the combination of those methods (Dux Speltz & Chukharev-Hudilainen., 2021). These approaches have the potential to enhance our understanding of how students embark on the revision process and shed light on the mechanisms of instructional feedback utilization. However, due to the relative novelty of these approaches, further research is needed on how to interpret these rich data and how to apply findings to real-life educational settings.

In conclusion, researchers demonstrate serious methodological efforts in exploring the dynamics of feedback and its impact on writing. However, to further advance our understanding, there is a pressing need for longitudinal studies that can unravel the unfolding processes over time. Additionally, enhancing rigor in both quantitative and qualitative approaches is in order, and a shift toward investigating specific writing outcomes promises to be a promising avenue for future investigations.

### Conclusions and Recommendation for Future Research

The development of students' writing skills represents an undeniable educational challenge, given its pivotal role as a predictor of academic success (Graham & Perin, 2007). Regrettably, inadequate writing abilities are not uncommon among college students (Greenberg, 2015). Our review of the literature spanning 2015 through 2023 demonstrates the key significance of instructional feedback, combined with revision opportunities, in augmenting students' writing performance (Graham et al., 2012; Huisman, Saab, Van Driel, et al., 2019; McKeown et al., 2020). Irrespective of the feedback source—be it from teachers, peers, automated systems, or tools—a consistent emergence of positive effect sizes on writing revisions is evident (Graham et al., 2015; Lipnevich, Panadero, et al., 2023; Wu & Schunn, 2021).

Our review has revealed gaps in the existing landscape of studies. Studies in higher education form the majority of examined studies, with samples from primary and secondary school students being significantly more scarce. This omission is concerning as writing is a fundamental educational skill, and neglecting earlier developmental stages restricts students' opportunities for academic success. To rectify this, we encourage researchers to shift their focus toward earlier stages of writing development, exploring effective feedback interventions for younger learners. Although the need to develop profession-specific genres typically emerges in higher education, students should enter this phase already equipped with a solid foundation in grammar, spelling, argumentation, and narratives, which should be a central focus of primary and secondary education. In sum, the cultivation of writing skills must commence at an earlier stage in the educational journey to ensure that students are well prepared for academic success across various domains, and we encourage researchers to invest their efforts into a closer examination of feedback and its effects on writing performance in samples of younger students.

In this review, we revealed an intriguing shift away from teachers as the sole source of feedback. Researchers appear to have re-

directed their focus toward alternative feedback sources. Notably, peer feedback has been shown to contribute to improvements in student writing performance. Moreover, the practice of providing feedback on peers' work has also yielded favorable outcomes on the reviewer's own written assignments. To maximize the efficacy of feedback, employing rubrics and exemplars after students' initial draft has been submitted has proven to be a useful way of helping learners enhance their writing products and processes alike. The promising avenue of automated feedback, employing artificial intelligence, offers deeper insights into student interaction with feedback. Encouraging innovative technology use and developing interventions for tailored, immediate feedback should be prioritized.

Feedback engagement is critical, as seen in studies like Daniel et al. (2014), where participants who explained their use of feedback presented higher-quality final papers. Investigating engagement mechanisms and implementing interventions for effective feedback loops are vital for comprehensive growth in writing skills across educational contexts (Lipnevich & Smith, 2022; Winstone et al., 2017).

In terms of methodological approaches, our review encompassed a diverse array of studies, ranging from experimental designs to interviews. This methodological variety enhances the robustness and depth of insights into the complex dynamics of feedback on writing. However, to advance methodological rigor in future research, we advocate for the incorporation of longitudinal investigations to capture the dynamic evolution of writing skills over time as influenced by formative feedback. Moreover, employing multiple scorers in evaluations can mitigate individual biases and enhance the reliability of findings. These methodological considerations are crucial for fostering a nuanced understanding of the intricate relationship between feedback and writing development, contributing to the overall advancement of research in this domain.

In conclusion, our review underscores the critical role of instructional feedback in enhancing writing performance, identifies gaps in research focus, and advocates for methodologically rigorous approaches to further

unravel the intricate dynamics of feedback on writing, thereby paving the way for advancements in this key educational domain.

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