

Rethinking virtual feedback in working environments: a systematic literature review

Personnel Review

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Abstract

Purpose – Remote work has become a prominent part of the current work environment, bringing new challenges for employees and managers. This includes finding ways to provide feedback that supports the development of teams and their members, which has led to growing interest in virtual feedback. While this topic is not new to management research, a comprehensive overview of how virtual feedback affects its recipients is missing.

Design/methodology/approach – Our systematic review analyzes 114 articles published between 1986 and 2025 in peer-reviewed academic journals in Business, Management and Psychology.

Findings – Applying Ilgen *et al.*'s (1979) feedback process model to virtual feedback, we firstly identify the aspects of virtual feedback that influence (a) the way it is perceived, (b) its acceptance by the recipient, (c) the willingness of the recipient to respond to the feedback and (d) the recipient's response. Secondly, we identify blind spots that have not yet received sufficient scholarly attention and propose directions for future research. Thirdly, our individual- and team-level implications support practitioners in communicating feedback virtually to reduce misunderstandings, promote feedback acceptance and foster the desired effects of virtual feedback.

Originality/value – The literature review provides a comprehensive and unique picture of a feedback recipient's multifaceted behavioral reactions to virtual feedback in the working environment, as well as the underlying mechanisms (e.g. cognitive reactions) explaining the effects.

Keywords Virtual feedback, Feedback process model, Virtual collaboration, Literature review

Paper type Literature review

1. Introduction

Virtual feedback has become an essential aspect of organizational practice to exchange evaluative and corrective information (Cavalcanti *et al.*, 2025). Although virtual feedback is not a new phenomenon and has been previously discussed, its relevance has grown as organizations navigate the future of the workplace, adopting various working arrangements, such as in-person, hybrid and virtual (Gintova, 2023). Even when employees work in person in a conventional office, or in hybrid or virtual environments, performance remains a key driver of an organization's competitive advantage (Crook *et al.*, 2008). In this vein, virtual feedback has received considerable research attention as a determinant of individual and team behavior (Ouverson *et al.*, 2021), which is a crucial means of ensuring team collaboration and organizational performance (Geister *et al.*, 2006; Jung *et al.*, 2010).

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Thus, researchers refer to virtual feedback (or digital or computer-mediated feedback) when provided with information and communication technologies (ICTs), such as email, instant messaging and video conferencing (Eisenberg *et al.*, 2021; Hertel *et al.*, 2005). Feedback encompasses evaluative or corrective information provided to individuals or teams about behavior, performance or processes, intended to influence future actions (Gabelica *et al.*, 2012; Geister *et al.*, 2006). Researchers addressing virtual feedback use various theoretical lenses, e.g. focusing on an individual's cognitive processes when receiving virtual feedback (He *et al.*, 2017; Wang *et al.*, 2014) or the diverse effects of virtual feedback on an individual and team level (Biron *et al.*, 2023; Chen *et al.*, 2020). Although previous researchers have attempted to review the literature on virtual feedback (see Carranza-Dávila *et al.*, 2022; Handke *et al.*, 2022; Leibold and Schwarz, 2022), their portrayals of the literature are limited by their involvement in their respective research contexts. Current reviews of the literature on virtual feedback focus exclusively on its effects (Carranza-Dávila *et al.*, 2022) or perceptions (Leibold and Schwarz, 2022) in an educational context, whereas Handke *et al.* (2022) focus on its effects in entirely virtual teams.

With the growing body of literature on virtual feedback, a comprehensive overview of the accumulated knowledge is lacking, as empirical investigations have yielded mixed and sometimes contradictory results. For instance, virtual feedback via email led to performance improvements among team members (Johnson and Connelly, 2014), whereas virtual feedback communicated through a peer evaluation system did not improve team member performance (Tavoletti *et al.*, 2019). Thus, the effects of virtual feedback and the reasons for their emergence remain only partially understood, and a comprehensive picture of the literature on virtual feedback is lacking. Yet we require knowledge of research gaps and a roadmap for further research to advance our understanding of virtual feedback.

Virtual feedback differs from in-person feedback because it occurs within communication environments characterized by varying media richness, reduced social cues and physical distance (Eisenberg *et al.*, 2021). These characteristics influence the feedback recipient's perception, acceptance and response toward the virtual feedback. For instance, virtual feedback might be perceived as less credible and more vulnerable to misinterpretation than in-person feedback (Golden *et al.*, 2009; Jansson and Kangas, 2025). In effect, virtual feedback requires dedicated theoretical and empirical attention.

The following research questions help us to guide our review by structuring existing knowledge: a) How do characteristics of virtual feedback, such as the feedback stimulus and the source of feedback, shape a recipient's cognitive perception and acceptance of the virtual feedback, and ultimately influence the recipient's behavioral response? b) What effects does virtual feedback have when provided on an individual-level compared to a team-level? and c) What managerial implications can be derived from the current literature for organizations to minimize miscommunication and foster the desired effects of virtual feedback?

Addressing these questions requires situating virtual feedback within the broader organizational context in which it is increasingly used.

To capture the richness of the literature on virtual feedback in organizational contexts, we conducted a systematic literature review of 114 peer-reviewed articles published between 1986 and 2025 in peer-reviewed academic journals in Business, Management and Psychology. As organizations transition among in-person, hybrid and virtual work models (Gintova, 2023), virtual communication has become essential for effective collaboration (Gibson *et al.*, 2023). Regardless of whether employees work in person, in a hybrid arrangement or fully virtually, we focus our investigations on virtual feedback communicated via ICTs within the workplace. We draw on Ilgen *et al.*'s (1979) feedback process model to address the multidimensional nature of feedback and systemize the process by which feedback influences behavior.

The model employs the stimulus-organism-response (SOR) framework (Mehrabian and Russell, 1974) to explain individual behavior in response to feedback. It demonstrates that environmental cues (stimuli) can trigger an individual's internal assessment state (organism), leading to a specific behavior (response) (Mehrabian and Russell, 1974). As Ilgen *et al.* (1979)

established a foundation for subsequent research on feedback, this model provides a sound basis for organizing and integrating literature on virtual feedback (Wang *et al.*, 2014). This procedure not only allows us to determine the effects of virtual feedback but also to understand how these effects arise at the individual level through the feedback recipient's cognitive processes (e.g. perception and acceptance of virtual feedback). By comprehensively identifying an individual's cognitive processes, we can provide an essential lever in the transmission of virtual feedback to a) explain an individual's behavior and how to b) drive an individual's desired behavior.

Our literature review extends well beyond existing work by comprehensively examining the feedback recipient's multifaceted cognitive and behavioral reactions at both the individual and team levels in the workplace.

Our work enriches the academic discussion on virtual feedback in at least three ways. First, we advance existing research by examining how characteristics of virtual feedback shape recipients' cognitive processing and, in particular, their acceptance of feedback, as well as the subsequent behavioral responses. By applying Ilgen *et al.*'s (1979) feedback process model to virtual feedback, we provide an integrated understanding of how its core mechanisms operate in mediated interaction and identify aspects that remain underexplored. Second, we provide guidance for future research by synthesizing existing knowledge, identifying gaps within the literature and formulating a structured research agenda. Third, by focusing on the hybrid and virtual working environment, we derive implications for scholars and practitioners at both the individual and team levels, thereby allowing improvements in the design of feedback processes for contemporary organizations.

2. Conceptual background

Integrating Ilgen *et al.*'s (1979) feedback process model into the stimulus-organism-response (SOR) model (Mehrabian and Russell, 1974) provides a theoretical basis for explaining an individual's behavior in response to virtual feedback.

2.1 Stimulus

Within the SOR model, stimulus refers to external cues originating from the environment that initiate a cognitive reaction in the individual (Bigne *et al.*, 2020). In the context of virtual feedback, scholars referring to Ilgen *et al.*'s (1979) model note that feedback originates from three distinct sources: individuals in a work setting (e.g. supervisors and coworkers), the task environment and oneself (Podsakoff and Fahr, 1989). The feedback message, described as the *complex feedback stimulus*, is characterized by several dimensions, such as the feedback's timing, sign and frequency (Ilgen *et al.*, 1979).

Feedback sign captures the valence of a message and is a core element of the feedback stimulus that shapes recipients' cognitive processing. While positive feedback reinforces desired behavior, negative feedback highlights performance discrepancies and signals the need for correction (Ilgen *et al.*, 1979).

2.2 Organism

The organism captures the individual's internal psychological processes that are activated when the individual encounters a stimulus. Hence, the organism represents the mediating state between environmental input and behavioral output (Mehrabian and Russell, 1974). Based on the feedback process model (Ilgen *et al.*, 1979), the underlying cognitive processes that explain the recipient's reactions to feedback are the *perception* and *acceptance of feedback*, the *desire to respond* and the *intended response*.

For instance, *feedback negativity* is treated as a recipient's perception of how unfavorable the feedback message is. Thus, it is defined as a subjective cognitive evaluation formed by the feedback recipient (Wang *et al.*, 2014).

2.3 Response

Response represents the observable behavioral outcomes that emerge from an individual’s internal processing of external stimuli (Mehrabian and Russell, 1974). Within the context of virtual feedback, the response captures how individuals translate feedback into concrete actions at the individual level, such as through changes in behavior (Petrucci and Rivera, 2018), or at the team level, e.g. by influencing the team’s productivity (Kwasnitschka et al., 2024).

Building on the SOR model (Mehrabian and Russell, 1974), Ilgen et al.’s (1979) feedback process model offers a fine-grained conceptualization and decomposes the feedback process into distinct yet interrelated components. It includes the characteristics of the feedback message, source and recipient, as well as cognitive processes, contextual influences and resulting responses to the virtual feedback. Following Ilgen et al.’s (1979) feedback process model, Table 1 outlines the categories of the feedback process and provides conceptual definitions and a classification logic.

Table 1. Definition of categories and classification logic of Ilgen et al.’s (1979) feedback process model

Category	Definition (Ilgen et al., 1979)	Classification logic
Source	The <i>Source</i> refers to the origin from which feedback is received. Sources may include other individuals (e.g. supervisors and coworkers), the task environment itself or the individual (self-generated feedback)	Classified as <i>Source</i> when the focus is on the origin of the feedback or characteristics of the feedback provider rather than the content of the feedback message, e.g. anonymous vs identified feedback provider, emotional expressions of the feedback provider
Complex Feedback Stimulus	The <i>Complex Feedback Stimulus</i> comprises the information communicated about an individual’s prior behavior and all message-related characteristics that determine its informational value	Classified as <i>Complex Feedback Stimulus</i> when the focus is on characteristics of the feedback message itself. Virtual feedback may vary in its sign, frequency, immediacy and information richness. This category also encompasses the level at which virtual feedback is delivered, distinguishing between the individual and team level
Perception of Feedback	The <i>Perception of Feedback</i> refers to the recipient’s initial cognitive awareness and perception of the feedback stimulus	Classified as <i>Perception of Feedback</i> when the feedback recipient sensed the feedback stimulus. Classification is restricted to the acquisition of the feedback stimulus, ensuring that the feedback message was noticed, e.g. the perceived richness of the virtual feedback message or the perceived credibility of the feedback source
Acceptance of Feedback	The <i>Acceptance of Feedback</i> comprises the evaluative phase, where the recipient interprets the feedback message. It includes the degree to which the recipient believes the feedback accurately portrays their behavior	Classified as <i>Acceptance of Feedback</i> when the focus is on the subjective interpretation of the feedback stimulus. It addresses the feedback recipient’s evaluation of or rejection of the virtual feedback, e.g. satisfaction with it or perceived accuracy
Desire to Respond	The <i>Desire to Respond</i> refers to the motivational state that reflects the recipient’s willingness to respond to virtual feedback	Classified as <i>Desire to Respond</i> when a recipient’s motivation to act upon the virtual feedback is formed, after accepting the feedback but before behavioral intentions are created, e.g. motivation to change one’s behavior

(continued)

Table 1. Continued

Category	Definition (Ilgen <i>et al.</i> , 1979)	Classification logic
Intended Response	The <i>Intended Response</i> comprises forming beliefs about the response and setting goals for specific future actions in response to the virtual feedback received	Classified as <i>Intended Response</i> when a feedback recipient forms beliefs about setting specific behavioral changes, e.g. intention to increase one's effort
Response	The <i>Response</i> represents the actual behavioral outcomes of processing the virtual feedback	Classified as <i>Response</i> when the outcome of the virtual feedback on an individual level or on a team level is represented, e.g. positive effect of virtual feedback on an individual's well-being or team performance
Individual Difference Characteristics	The <i>Individual Difference Characteristics</i> refer to attributes of the feedback recipient that moderate feedback processing and shape how virtual feedback is perceived, accepted and acted upon	Classified as <i>Individual Difference Characteristics</i> when the focus is on the feedback recipient's characteristics that can influence multiple stages of the virtual feedback processing, e.g. an individual's culture, self-efficacy or goal orientation
External Constraints	<i>External Constraints</i> refer to contextual conditions that facilitate or inhibit the translation of an individual's Intended Response into an actual response	Classified as <i>External Constraints</i> when the focus is on contextual or environmental conditions that enable or restrict feedback-related behaviors; e.g. a remote working environment is considered inadequate for virtual feedback due to the risk of misinterpretation

3. Methodology

To ascertain the state of the academic discussion on virtual feedback in teams within the business and management context, we conducted a systematic literature review and a content analysis (Page *et al.*, 2020). Drawing on Ilgen *et al.*'s (1979) feedback process model, we analyzed the literature to reveal elements related to the source, the message, the recipient and the underlying cognitive processes that explain the recipient's reactions to virtual feedback in computer-mediated communication.

We base the description of the methodological approach on the PRISMA statement (Page *et al.*, 2020). In the first step, we screened the existing literature and related fields to identify works addressing computer-mediated feedback in organizations, using the Web of Science and EBSCO databases. We included articles dating back to 1986, the year in which the first study by Siegel *et al.* (1986) addressed how emails reduce the social context in organizational communication. To ensure comprehensive coverage and to identify relevant studies not indexed in the curated databases, we cross-validated our search strategy by conducting an additional search via Google Scholar. Google Scholar was not used as a primary database to search for literature on virtual feedback; it was used solely to verify that the search strategy applied in Web of Science and EBSCO captured the relevant peer-reviewed literature on virtual feedback. To ensure a consistent level of scientific rigor and methodological transparency, we focused exclusively on peer-reviewed journal articles and excluded grey literature. We used an extensive list of relevant terms (Table 2) to search journals in the fields of Management, Business, Psychology, Psychology Multidisciplinary and Psychology Experimental. We corrected for inter-category and inter-database doublets within and between databases, leading to 11,655 published articles.

In the second step, two authors independently screened the article titles, applying predefined inclusion and exclusion criteria. Due to the specific aim of this work, which is to provide a comprehensive understanding of an individual's reaction to virtual work-related

Table 2. Search terms used in Web of Science, EBSCOhost and Google Scholar (incl. Quotation marks)

Search terms		
“Virtual”	“Telework”	“Work* at Home”
“Digital”	“Virtual Collaboration”	“Work* from Home”
“Online”	“Distributed”	“Home Office”
“Hybrid”	“Distance”	“Remote”
	AND	
“Feedback”	“Appraisal”	“Peer Evaluat*”

feedback communicated via ICTs and to understand the individual’s underlying cognitive processes, we defined inclusion criteria for our work.

Further, we distinguished virtual feedback from related constructs such as seeking information, help or advice. Although these constructs involve obtaining information or assistance and share relational mechanisms with feedback processes (Lim *et al.*, 2020), they differ from feedback. Feedback comprises evaluative or corrective information intended to influence an individual’s future actions (Ilgen *et al.*, 1979). In contrast, seeking information, help or advice primarily aims to reduce uncertainty or solve problems (Lim *et al.*, 2020). Accordingly, academic works from these research streams were included if virtual feedback, delivered via ICTs, was a main focus of the investigation. This distinction ensured conceptual clarity and maintained the focus on virtual feedback in organizational contexts.

As Ilgen *et al.’s* (1979) feedback process model is addressing feedback in performance-oriented organizations, we excluded all articles with contextual misfit, namely, e.g. feedback in social information space and social networking sites, online feedback forums and marketplaces, distributed social arrangements, e.g. gambling and virtual reality games, neuroscientific investigation of feedback (Schindler *et al.*, 2019), therapeutic mechanisms and technical feedback in the development and implementation process, e.g. apps. Applying this filter resulted in 1,509 remaining articles. The third author acted as a referee in cases of inconclusive results. This was the case during this and the following step, aligning our results in short discussions.

In the third step, two authors screened the abstracts and full papers of the remaining 1,509 articles, excluding 1,218 papers by applying identical exclusion criteria. In the fourth step, we excluded an additional 177 articles due to a lack of organizational context and virtual communication. These steps led to 114 articles being included and analyzed in-depth in this systematic literature review. We depict the literature review process based on the PRISMA statement (see Page *et al.*, 2020) in Figure 1.

Two authors subsequently conducted an in-depth content analysis that went beyond theoretical and methodological classifications by employing a structured coding procedure aligned with Ilgen *et al.’s* (1979) feedback process model. Again, a third author acted as referee for inconclusive results. The coding of the results followed a systematic, multi-step process described by Page *et al.* (2020), resulting in an underlying concept matrix as a basis for subsequent research (Watson and Webster, 2020).

We first documented the theoretical foundation for each article and, second, identified the research methodology employed. In a third step, we analyzed the elements of Ilgen *et al.’s* (1979) feedback process model, namely: complex feedback stimulus, source of feedback, perception of feedback, acceptance of feedback, desire to respond to feedback, intended response, characteristics of the feedback recipient, external constraints and the response. This step allowed us to determine whether, and to what extent, the articles addressed the elements of Ilgen *et al.’s* (1979) feedback process model as applied to virtual feedback. Fourth, we extracted the independent and dependent variables examined in each study to understand the conceptual structure and causal assumptions underlying the research. In this vein, we analyzed

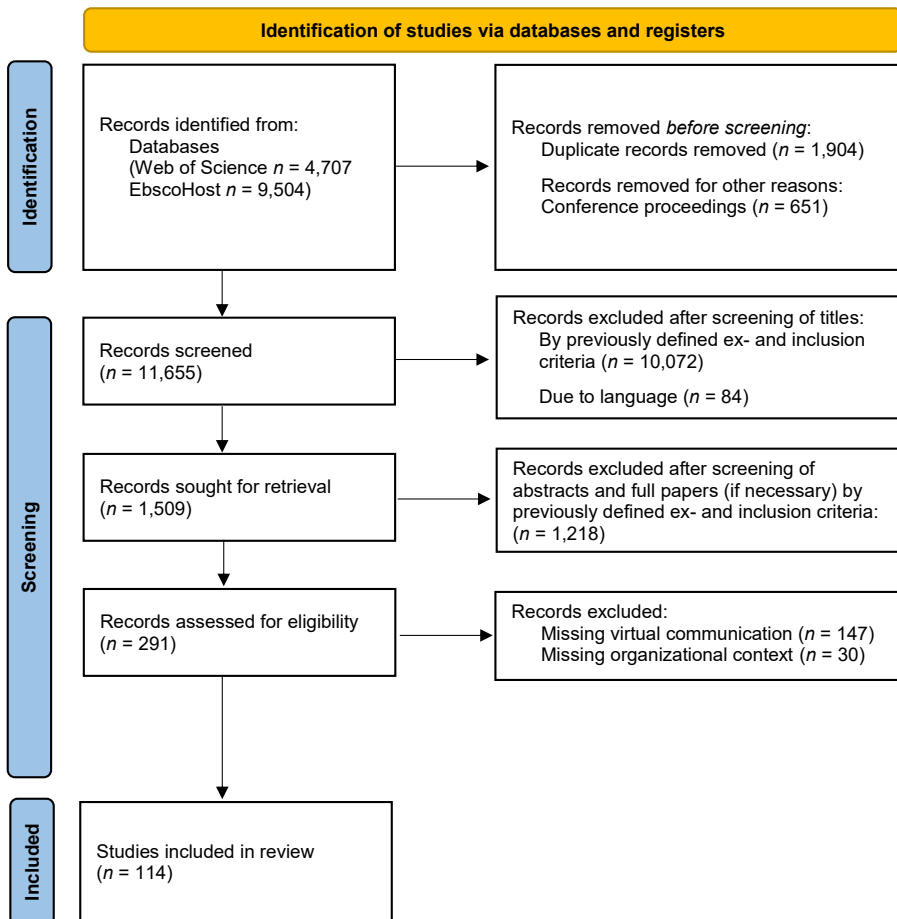


Figure 1. Literature review process

the connections between these variables, identifying whether the academic works proposed direct, mediating or moderating relationships. Further, we synthesized the key results reported in each article. To ensure a rigorous and transparent organization of the findings, we constructed a matrix that synthesizes the 114 articles included in this systematic literature review. This matrix provides a structured basis for identifying recurring patterns, conceptual inconsistencies and underexplored areas in research on virtual feedback (see the [Supplementary Table](#)).

4. Results

A multitude of theoretical lenses and methodologies have been applied to research on virtual feedback (see the [Supplementary Table](#)). In line with the SOR model (see [Mehrabian and Russel, 1974](#)), [Ilgen et al.'s \(1979\)](#) feedback process model demonstrates a sound basis to visualize the stimuli of virtual feedback, which then influences an individual's cognitive processes and, thus, leads to a response at an individual and team level. This results in a conceptual framework that provides a solid foundation for organizing and integrating the

literature on virtual feedback. Figure 2 illustrates our conceptual framework, which reveals the elements examined in the literature on virtual feedback.

To ensure a coherent synthesis of the literature, cognitive processing mechanisms (e.g. feedback perception and acceptance) and resulting responses are examined within the categories of Ilgen et al.'s (1979) feedback process model, thereby capturing how specific feedback characteristics are associated with cognitive reactions and subsequent individual- and team-level outcomes.

4.1 Virtual feedback sign

4.1.1 Direct behavioral outcomes of virtual feedback sign. Academic works identify the sign of a virtual feedback message as a critical factor influencing the direct relationships between feedback stimuli and individual- and team-level outcomes. On the one hand, literature on virtual feedback reveals that a positive sign of the feedback message has a positive effect on building open mind (Sung and Mayer, 2012), cohesion, discussion satisfaction, task time and group efficacy (Kahai and Cooper, 2003). Receiving positive virtual feedback also strengthens team identification (Sivunen, 2006) and boosts confidence in the team's collective abilities (Schepers et al., 2011).

Beyond these socio-emotional outcomes, positive virtual feedback contributes to a supportive and collaborative team climate. Vinagre and Corral Esteban (2018) show that positive virtual feedback fosters a close, friendly atmosphere, enhancing collaboration and learning. Moreover, positive virtual feedback cultures enhance trust among team members and encourage constructive and considerate communication behaviors (Breuer et al., 2020). Positive virtual feedback has also been found to increase engagement with feedback and improve performance when learners perceive feedback as useful and actionable (Mayordomo et al., 2022).

On the other hand, negative virtual feedback carries inherent risks: Jaakson et al. (2019) demonstrate that negative feedback on team performance reduces the overall trust and trustworthiness among team members. Additionally, negative feedback from team members can lead to severe task distractions (Marler and Marett, 2013).

4.1.2 Cognitive processing of virtual feedback sign. 4.1.2.1 Perception of the virtual feedback sign. The literature suggests that the perception of feedback differs when communicated virtually versus in person, particularly when the virtual feedback is negative. Several studies have shown that negative feedback is perceived as less credible, more

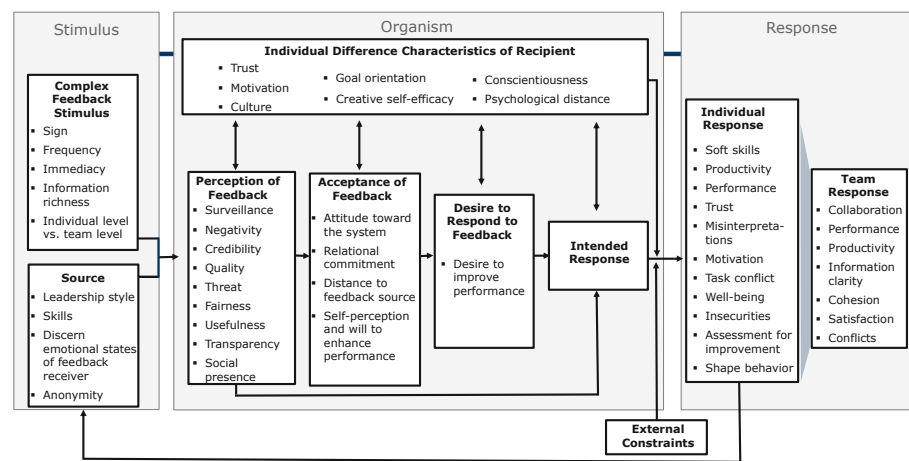


Figure 2. Conceptual framework of virtual feedback

threatening and more ambiguous in virtual environments compared to face-to-face settings. For instance, [Golden et al. \(2009\)](#) demonstrate that negative feedback is perceived as less credible because virtual settings intensify the perceived negativity of negative feedback, thereby diminishing its perceived credibility and fairness in the eyes of the feedback recipient ([Golden et al., 2009](#)). Studies examining the perception of virtual feedback have found that individuals perceive feedback as surveillance, which in turn reduces the creative performance of individuals with a low goal orientation ([Wong et al., 2021](#)).

Contextual and social cues also shape the perception of the feedback sign. [Newcombe and Ashkanasy \(2002\)](#) demonstrate that facial expressions accompanying feedback influence recipients' interpretations of the feedback message. Positive feedback accompanied by negative facial cues resulted in significantly less positive evaluations than feedback delivered with congruent emotional signals ([Newcombe and Ashkanasy, 2002](#)).

[Kankanhalli et al. \(2006\)](#) show that negative or delayed feedback in asynchronous media is perceived as a sign of conflict, which might increase task conflict. However, [Mayordomo et al. \(2022\)](#) found a positive relationship between positively perceived virtual feedback on an individual's effort to improve performance.

In addition, [Breuer et al. \(2020\)](#) demonstrate that employees' perceptions of a positive feedback culture contribute to the development of trust within teams. Thus, the effects of feedback sign are not limited to isolated feedback episodes but may also emerge through collective perceptions of the broader feedback environment.

4.1.2.2 Acceptance of the virtual feedback. The way virtual feedback is perceived affects its acceptance, because negatively perceived feedback can undermine the recipient's acceptance. [Wang et al. \(2014\)](#) conducted an experiment, measuring the effect of perceived feedback negativity on an individual's acceptance. The researchers found that perceived feedback negativity decreased feedback acceptance. However, [Wang et al. \(2014\)](#) show that the perceived goodwill of the feedback provider and the perceived negativity of the virtual feedback jointly influence individuals' acceptance of virtual feedback. Specifically, when virtual feedback is specific and accompanied by liking emoticons, recipients interpret the provider's intentions as benevolent, which increases acceptance, even when the virtual feedback is negative ([Wang et al., 2014](#)). In contrast, unspecific feedback paired with disliking emoticons is perceived as negative by the feedback recipient and thus reduces acceptance of the virtual feedback. [Mukherjee et al. \(2012\)](#) show that supervisors who provide consistent and individualized feedback strengthen team identification and commitment. This relational bond increases the likelihood that feedback, whether positive or corrective, is perceived as constructive and thus accepted ([Mukherjee et al., 2012](#)). Moreover, [Vinagre and Corral Esteban \(2018\)](#) emphasize that positive feedback fosters a close, friendly atmosphere in virtual teams. This atmosphere reinforces relational commitment, which in turn enhances the acceptance of virtual feedback ([Vinagre and Corral Esteban, 2018](#)). Regardless of whether virtual feedback is perceived as positive or negative, [Nasir et al. \(2019\)](#) found that evaluative and explanatory feedback positively influence a recipient's perceptions of its usefulness. In turn, higher perceived usefulness of the feedback increases the recipient's acceptance of the feedback ([Nasir et al., 2019](#)).

4.1.3 Moderating factors on the cognitive processing of virtual feedback sign. A moderator in the literature that influences the effect of feedback sign on response is team members' trust ([Vinagre and Corral Esteban, 2018](#)). In their research, [Vinagre and Corral Esteban \(2018\)](#) argue that team members' trust moderates the effect of positive feedback on team collaboration, which increases when trust is high. They observed that creating a close, friendly atmosphere among individuals is essential for effective collaboration and learning when providing virtual feedback ([Vinagre and Corral Esteban, 2018](#)). Besides team trust, employees' creative self-efficacy and mastery goal orientation moderate the relationship between negative feedback and creative tasks, and this relationship is stronger among employees with high creative self-efficacy and mastery goal orientation ([Wong et al., 2021](#)).

Wong *et al.* (2021) propose that employees with high creative self-efficacy and a mastery goal orientation tend to exert greater effort in subsequent creative tasks.

The perception and acceptance of virtual feedback are influenced by cultural values, which shape how recipients interpret critical feedback. Milliman *et al.* (2002) found that supervisory criticism is perceived differently across cultural contexts. Whereas employees in individualistic cultures tend to interpret critical feedback as valuable information for performance improvement, employees in collectivistic cultures are more likely to perceive the same feedback as a threat to group harmony and interpersonal relationships (Milliman *et al.*, 2002).

Researchers found that individuals' acceptance of virtual feedback is connected to their self-perception (Rivera *et al.*, 2024). Recipients who view themselves as capable of growth are more likely to interpret feedback as an informative message rather than as a threat to their self-image. In effect, a positive self-perception enhances the willingness to regard feedback as an opportunity for improvement, thereby increasing the acceptance of virtual feedback (Rivera *et al.*, 2024).

4.2 Frequency of virtual feedback

4.2.1 *Direct behavioral outcomes of the frequency of virtual feedback.* Feedback frequency refers to the regularity with which employees receive performance-related information from supervisors, coworkers or other feedback providers (Gerards *et al.*, 2021). Overall, the literature suggests that frequent virtual feedback is associated with more favorable individual and team outcomes than infrequent feedback.

Findings demonstrate the positive effects of weekly virtual feedback on performance (McLarnon *et al.*, 2019; Geister *et al.*, 2006) and virtual feedback at the midterm point on teamwork skills (Andrade *et al.*, 2020). Frequent feedback contributes to higher levels of motivation, satisfaction, cohesion, trust, self-efficacy and performance in virtual teams (Hertel and Geister, 2005; Geister *et al.*, 2006). In particular, performance-related feedback is most effective when it is frequent, timely and concrete at both the individual and team level (Hertel and Geister, 2005). Additional evidence indicates that frequent feedback supports retention and sustained effort over time. Depoo and Hyršlová (2022) show that periodic virtual feedback positively influences employee retention.

In contrast, infrequent feedback is associated with several consequences. Reduced feedback frequency, characterized by slow feedback cycles, increases the likelihood of erroneous interpretations and attribution errors because employees receive less information for validating their assumptions (Cramton, 2001).

Furthermore, reduced feedback frequency can undermine self-efficacy and contribute to the loss of motivation (Hertel and Geister, 2005). In remote work environments, infrequent communication also limits opportunities for virtual feedback exchange and informal learning (Gerards *et al.*, 2021).

Several studies indicate that the virtual working environment creates a greater need for frequent feedback. In virtual teams, the lack of rich face-to-face interaction motivates team members to engage in more continuous communication and feedback to maintain effectiveness (Kayworth and Leidner, 2000; Mulki *et al.*, 2009).

4.2.2 *Cognitive processing of the frequency of virtual feedback.* 4.2.2.1 *Perception of the virtual feedback frequency.* Kayworth and Leidner (2000) demonstrate that continuous virtual feedback from supervisors enhances the perceived effectiveness of the feedback provider. Their study suggests that frequent virtual feedback is interpreted as a sign of relational commitment and managerial competence, which increases the feedback recipient's acceptance of virtual feedback (Kayworth and Leidner, 2000). Similarly, Jansson and Kangas (2025) show that frequent communication increases employees' perception that the feedback provider (supervisor) is accessible and available.

4.2.2.2 Acceptance of the virtual feedback. In contrast, infrequent feedback may create uncertainty regarding performance expectations and reduce opportunities for corrective action. Sardeshmukh *et al.* (2012) show that in telework environments, reduced feedback frequency is perceived as a loss of informational richness and social connection. Employees often interpret infrequent feedback as a lack of support, which can diminish engagement and weaken their acceptance of the virtual feedback (Sardeshmukh *et al.*, 2012).

4.2.2.3 Desire to respond to the virtual feedback. The literature further suggests that the effect of feedback frequency depends not only on the amount of feedback but also on its quality. Rivera *et al.* (2024) argue that the quality of virtual feedback is more important than its quantity. While frequent feedback can increase the feedback recipient's developmental efforts, employees particularly value constructive, detailed and actionable feedback. Frequent and constructive virtual feedback increases the feedback recipient's perception of feedback usefulness and motivates further developmental behavior (Rivera *et al.*, 2024).

4.2.3 *Moderating factors on the cognitive processing of the frequency of virtual feedback.* Fan *et al.* (2014) note the importance of adjusting the frequency of feedback to the task type. In their study, frequent direction-giving feedback in routine tasks was perceived as useful and was accepted, while creative tasks benefited more from encouraging feedback delivered at strategic intervals. The researchers suggest that the acceptance of virtual feedback is shaped not only by how often feedback is given but also by how well its timing aligns with task demands and the expectations of the feedback recipients (Fan *et al.*, 2014).

A feedback recipient's level of motivation also moderates the effectiveness of feedback frequency. Geister *et al.* (2006) found that the positive effects of weekly feedback on motivation, satisfaction and performance are stronger for initially less-motivated team members.

Recent research highlights the importance of feedback-seeking behavior. Rivera *et al.* (2024) demonstrate that employees who actively seek feedback are more likely to interpret it constructively, receive more detailed feedback and engage in future developmental efforts. The benefits of frequent feedback, therefore, depend not only on the behavior of feedback providers but also on feedback recipients' willingness to seek and utilize the virtual feedback (Rivera *et al.*, 2024). Jansson and Kangas (2025) show that leaders in remote environments must actively maintain frequent feedback because virtual settings reduce spontaneous feedback opportunities and increase the risk of feedback misinterpretation due to the absence of nonverbal cues.

4.3 *Immediacy of virtual feedback*

4.3.1 *Direct behavioral outcomes of the immediacy of virtual feedback.* Researchers investigated the complex feedback stimulus regarding immediacy, which refers to the time between an outcome and the receipt of outcome-related virtual feedback (Chen *et al.*, 2020). Thus, immediate and delayed virtual feedback refers to whether the time between an outcome and the provision of feedback is short or long (Chen *et al.*, 2020).

The lack of immediate virtual feedback in electronic communication results in task conflict (Kankanhalli *et al.*, 2006) and increased frustration (Powers *et al.*, 2011), whereas contemporaneously available virtual feedback leads to motivation gains (Hertel *et al.*, 2008), productivity of employees (Shepherd *et al.*, 1995) and virtual team success (Fan *et al.*, 2014).

Beyond performance-related outcomes, the immediacy of virtual feedback also affects a variety of social and relational outcomes. Immediate feedback increases social presence, discussion satisfaction and group efficacy and reduces task completion time in virtual teams (Kahai and Cooper, 2003). In contrast, delayed feedback weakens social bonds, reduces trust among coworkers and impairs the clarity of feedback interpretation (Friedman and Currall, 2003).

4.3.2 *Cognitive processing of the immediacy of virtual feedback.* 4.3.2.1 Perception of the immediacy of virtual feedback. Studies show that immediate feedback is perceived as more transparent and supportive, whereas delayed feedback is perceived as ambiguous. [Shepherd et al. \(1995\)](#) demonstrate that immediate feedback increases the feedback recipient's perceived transparency of the feedback and, thus, motivates an individual's productivity. Furthermore, researchers have shown that feedback immediacy strengthens team members' perceptions of social presence ([Hertel et al., 2008](#)) and is perceived as useful for interpreting the feedback provider's emotional cues in a virtual working environment ([Powers et al., 2011](#)).

Nevertheless, immediate feedback does not necessarily elicit positive responses, as demonstrated by [Chen et al. \(2020\)](#). The researchers found that the feedback receiver may perceive rapid virtual feedback as negative when it provides only limited informational support due to its brevity ([Chen et al., 2020](#)). Further, [Friedman and Currall \(2003\)](#) argue that delayed feedback in e-mail communication is perceived as less useful by the feedback recipient because it reduces clarity in understanding coworkers' feedback. Their findings show that recipients perceive delayed responses as a lack of social presence, which increases uncertainty and reduces trust ([Friedman and Currall, 2003](#)).

4.3.3 *Moderating factors on the cognitive processing of the immediacy of virtual feedback.* Several contextual factors influence the effectiveness of immediate virtual feedback. Communication media characteristics moderate the relationship between feedback immediacy and performance outcomes. [Raghuram et al. \(2019\)](#) demonstrate that the positive relationship between feedback and performance strengthens when communication technologies offer greater opportunities for immediate interaction. Likewise, [Dennis and Kinney \(1998\)](#) argue that media richness influences how recipients perceive and benefit from rapid feedback exchanges.

Further, the work context moderates the availability and effectiveness of immediate feedback. [Shaik and Makhecha \(2019\)](#) found that global virtual teams often face structural barriers that impede the rapid acquisition of feedback. Differences in time zones, geographical dispersion and asynchronous communication patterns therefore weaken the beneficial effects of feedback immediacy ([Shaik and Makhecha, 2019](#)). Similarly, research suggests that the positive effect of feedback on performance becomes stronger when communication technologies support immediate feedback exchanges ([Raghuram et al., 2019](#)).

4.4 *Virtual feedback richness*

4.4.1 *Direct behavioral outcomes of the virtual feedback richness.* In their quantitative study, [Sardeshmukh et al. \(2012\)](#) refer to [Daft and Lengel \(1986\)](#) for defining media richness. In their understanding, media vary in their capacity to provide immediate feedback, the multiplicity of cues and the variety of language. [Eisenberg et al. \(2021\)](#) provide a more detailed explanation of information richness by referring to media rich in cues, such as face-to-face and video conferencing, which allow for immediate verbal and nonverbal interactions. In contrast, lean feedback, such as written media (e-mail or instant messages), contains fewer verbal and non-verbal cues ([Eisenberg et al., 2021](#)). [Dennis and Kinney \(1998\)](#) recommend using media that provides rich feedback if a quick decision-making process requires extensive feedback, because it leads to enhanced performance. [Weisband and Atwater \(1999\)](#) further demonstrate that the richness of virtual feedback affects an individual's self-awareness. Compared to communication settings that provide rich verbal and nonverbal cues, computer-mediated communication can reduce the availability of virtual feedback, which decreases an individual's self-awareness ([Weisband and Atwater, 1999](#)).

4.4.2 *Cognitive processing of the virtual feedback richness.* 4.4.2.1 Perception of the virtual feedback richness. [Cavalcanti et al. \(2025\)](#) show that in remote teams, the length and specificity of feedback significantly enhance perceived clarity and usefulness of the virtual feedback. Nevertheless, [Sardeshmukh et al. \(2012\)](#) have found that remote-working employees perceive feedback as less rich and more cognitively demanding because lean

media, such as email, require greater effort to interpret the tone of the feedback provider, as well as the intent and contextual meaning of the feedback message. Further evidence suggests that lean communication channels reduce the effectiveness of feedback. [Hebert and Vorauer \(2003\)](#) found that individuals perceive feedback as more positive and clearer in face-to-face interactions than in computer-mediated communication. The absence of nonverbal information in lean media makes task-relevant virtual feedback more difficult to interpret accurately ([Hebert and Vorauer, 2003](#)). When employees perceive low manager knowledge sharing and job feedback, their turnover intentions increase ([Gutworth et al., 2023](#)). [Yu and Schunn \(2023\)](#) demonstrate that longer, more elaborate peer feedback is perceived as more useful and credible, even when delivered through lean media. Their results suggest that content richness can partially compensate for low media richness by providing more interpretive cues ([Yu and Schunn, 2023](#)).

4.4.2.2 Acceptance of virtual feedback. [Driskell et al. \(2003\)](#) demonstrate that remote environments limit feedback channels and reduce immediacy, making feedback less clear and less actionable. Restricted feedback is associated with lower acceptance because recipients perceive the virtual feedback as incomplete or insufficiently contextualized ([Driskell et al., 2003](#)). This is supported by [Jansson and Kangas \(2025\)](#), who found that nonverbal cues, such as tone of voice, facial expressions and posture, are largely absent or diminished in digital communication channels. The researchers highlight that acceptance of virtual feedback declines unless feedback providers exert additional effort to compensate for the relational and communicative deficits created by physical distance ([Jansson and Kangas, 2025](#)).

By comparing the effects of employees' reactions to feedback from an online performance appraisal system vs a traditional paper-and-pencil approach, [Payne et al. \(2009\)](#) found that employees who received virtual feedback reported higher levels of rater accountability. The employee's perception of feedback mediates this relationship, and team members who received virtual feedback reported lower-quality ratings of the feedback than those who received feedback via the traditional paper-and-pencil approach. Furthermore, employees' acceptance of feedback mediates the complex feedback stimulus-response relationship because employees' attitudes toward an online performance appraisal system, e.g. satisfaction, influence their usage behavior of the feedback ([Payne et al., 2009](#)).

4.4.3 *Moderating factors on the cognitive processing of the virtual feedback richness.* The literature analysis on virtual feedback reveals that remote work serves as an external constraint that may affect an individual's ability to process virtual feedback ([Jansson and Kangas, 2025](#)). The absence of nonverbal cues in written communication or audio-only video calls increases the likelihood of misinterpretation. It affects the recipient's ability to accurately perceive the intended feedback message, e.g. developmental feedback. Therefore, supervisors view virtual environments as inadequate for providing developmental feedback to their subordinates due to the sensitive nature of such conversations ([Jansson and Kangas, 2025](#)).

Beyond the availability of communication cues, feedback immediacy appears to shape perceptions of feedback richness. [Dennis and Kinney \(1998\)](#) show that communication media that allow immediate feedback are perceived as richer than media characterized by delayed interaction. Consequently, the effectiveness of feedback richness depends not only on the number of available cues but also on the speed with which communicators can exchange information ([Dennis and Kinney, 1998](#)).

4.5 Virtual feedback availability

4.5.1 *Direct behavioral outcomes of the virtual feedback availability.* Researchers experimentally examined outcomes related to the availability of virtual feedback by comparing conditions in which teams or individuals received virtual feedback with conditions in which no virtual feedback was provided.

Researchers have found that teams receiving virtual feedback exhibited higher levels of actual reflection ([Konradt et al., 2015](#)) and fewer errors ([Ouverson et al., 2021](#)) compared to

teams that did not receive virtual feedback. Similarly, [Feng et al. \(2021\)](#) demonstrate that virtual feedback strengthens the relationship between error detection and error correction, suggesting that individuals are more likely to correct mistakes when virtual feedback is available.

Beyond error reduction, the availability of feedback promotes cooperative and collective team behaviors. [Kim et al. \(2012\)](#) found that groups receiving virtual feedback displayed higher levels of cooperation, whereas groups without virtual feedback exhibited lower levels of cooperation. Likewise, [Henning et al. \(1997\)](#) showed that computer-generated feedback improved teams' management of rest-break behavior during collaborative work.

Several studies indicate that the availability of feedback positively affects motivation, learning and well-being. [Hsiao et al. \(2022\)](#) found that individuals who received virtual peer-evaluation feedback demonstrated better programming learning outcomes than those who did not. Similarly, [Mishima-Santos et al. \(2021\)](#) reported a positive relationship between the availability of virtual feedback and employee well-being.

At the team level, the availability of feedback also improves performance regulation processes. [Ouverson et al. \(2021\)](#) demonstrated that virtual feedback at both the team and individual levels reduces performance errors, whereas the absence of virtual feedback leads participants to overestimate their own performance.

4.5.2 Cognitive processing of the virtual feedback availability. 4.5.2.1 Perception of virtual feedback availability. Compared with situations without feedback, the availability of virtual feedback alters how recipients perceive their performance. [Ouverson et al. \(2021\)](#) found that team feedback improves individuals' ability to assess their own performance accurately. However, recipients perceive feedback as useful primarily when it leads to observable performance improvements. If feedback does not contribute to improved outcomes, recipients are more likely to perceive it as not useful ([Ouverson et al., 2021](#)).

4.5.2.2 Acceptance of virtual feedback. Regarding the acceptance of virtual feedback in feedback-versus-no-feedback settings, findings suggest that acceptance depends strongly on the perceived usefulness of the virtual feedback. [Ouverson et al. \(2021\)](#) showed that recipients are more likely to use the virtual feedback when it contributes to tangible performance improvements.

Feedback availability also encourages self-awareness and reflection. [Konradt et al. \(2015\)](#) argue that virtual feedback stimulates reflective processes by providing information that enables individuals to evaluate and adjust their behavior. Similarly, [Hsiao et al. \(2022\)](#) demonstrate that feedback supports learning processes by helping recipients identify performance gaps and areas for improvement.

4.5.3 Moderating factors on the cognitive processing of the virtual feedback availability. The moderating effect of national culture explains that the availability of virtual feedback had contradictory effects in culturally diverse teams. In their experimental study, [He et al. \(2017\)](#) demonstrate that the availability of virtual feedback increases an individual's awareness of cultural differences and encourages empathy toward team members. However, recipients of virtual feedback interpret it differently depending on their cultural background. Whether virtual feedback mitigated perceptions of conflict for Canadian team members by evoking a sense of commonality, it did not reduce the perceptions of conflict for Japanese team members. Consequently, the effectiveness of feedback depends not only on its availability but also on how cultural values shape its interpretation ([He et al., 2017](#)).

In addition to cultural influences, team composition moderates the effects of virtual feedback. [Glikson et al. \(2019\)](#) emphasize the need to address team composition, specifically team members' conscientiousness, when providing virtual feedback. The researchers found that team members' conscientiousness moderates the effect of virtual feedback on team effort and team performance. Virtual feedback has a stronger positive effect in teams with a low proportion of highly conscientious members than in teams with a high proportion of highly conscientious members ([Glikson et al., 2019](#)).

4.6 Communication of virtual feedback on an individual vs team level

4.6.1 Behavioral outcomes and moderators of communicating virtual feedback on an individual vs team level. Academic research suggests that the level at which virtual feedback is communicated, whether it is directed at individual team members or at the team as a collective, influences how virtual feedback affects the response.

[Kwasnitschka et al. \(2024\)](#) experimentally examined the effects of feedback level on productivity and found that individual-level virtual feedback yields stronger productivity gains than team-level virtual feedback. This effect emerged for both positively and negatively framed virtual feedback. Specifically, positive virtual feedback at the individual level increased productivity by 10.40%, whereas negative virtual feedback increased it by 6.20%. The authors conclude that psychological distance serves as a moderator influencing this effect. When virtual feedback is provided at the individual level, recipients perceive reduced psychological distance, making the feedback more personally relevant and thus increasing productivity. When virtual feedback is provided at the team level, psychological distance is perceived as higher, leading to lower increases in productivity compared to when it is communicated at the individual level ([Kwasnitschka et al., 2024](#)).

In addition, [Kwasnitschka et al. \(2024\)](#) show that a strong sense of team membership and team identification moderate the relationship between team-level virtual feedback and productivity. Under conditions of strong team identification, psychological distance is reduced and team-level virtual feedback can be as effective as individual-level virtual feedback. Consequently, the communication of virtual feedback depends not only on the feedback level (individual vs team) but also on the feedback recipients' psychological attachment to the team ([Kwasnitschka et al., 2024](#)).

Further, [Ouverson et al. \(2021\)](#) found that virtual feedback at the team and individual levels influences different performance mechanisms. While both levels of virtual feedback reduced performance errors, team-level feedback additionally reduced participants' tendency to evaluate teammates negatively. These findings suggest that virtual feedback at the team level contributes to the development of shared performance awareness, whereas virtual feedback at the individual level primarily supports self-regulation ([Ouverson et al., 2021](#)).

[Walton and Gilbert \(2022\)](#) found that virtual feedback delivered at the team level improved the speed of completing a task more than virtual feedback provided at the individual level.

4.7 Feedback source

4.7.1 Direct behavioral outcomes of the feedback source. One of the few studies examining the direct effect of the source on response was conducted by [Fan et al. \(2014\)](#), examining the feedback approach. The researchers found a positive effect of direction-giving feedback on idea generation in teams when the source used a demanding feedback approach. Further, the findings demonstrate a positive effect of virtual feedback, communicated in more empathetic language, on employees' creative performance under the encouraging feedback approach ([Fan et al., 2014](#)).

4.7.2 Cognitive processing of the feedback source. 4.7.2.1 Perception of the feedback source. Studies reveal that the emotions and facial expressions displayed by the feedback source shape recipients' perceptions of the virtual feedback. Employees who received virtual feedback from an angry source have taken offense and responded by either blaming the source or making other excuses ([Johnson and Connelly, 2014](#)). Perceptions of feedback mediate this relationship: recipients perceive an angry feedback source as blaming others and, consequently, as less competent than emotionally neutral feedback providers ([Johnson and Connelly, 2014](#)).

Furthermore, [Wang et al. \(2014\)](#) demonstrated that the emotional expressions of the feedback source affect an individual's perceptions of the quality and acceptance of virtual feedback. Specifically, the perceived negativity of the source's emotional display reduces an

individual's perceived quality of the received virtual feedback and thus decreases a recipient's willingness to use the feedback (Wang *et al.*, 2014).

4.7.2.2 Acceptance of feedback. Driskell *et al.* (2003) note that the psychological closeness between the source and the recipient should be considered when addressing an employee's acceptance of feedback. The researchers argue that feedback is more likely to be accepted from sources that are psychologically closer to the recipient than from those more distant. Thus, the researchers suggest that recipients might accept feedback less readily from individuals in virtual collaboration environments who are perceived as more remote or removed from the immediate social setting, without empirically investigating this assumption (Driskell *et al.*, 2003).

Payne *et al.* (2009) compared virtual appraisal systems with traditional face-to-face instruments. The researchers demonstrate that recipients perceive the quality of virtual feedback systems to be lower than that of traditional face-to-face instruments, which reduces acceptance of virtual feedback. According to Payne *et al.* (2009), feedback recipients' attitudes toward feedback systems are multidimensional, as recipients evaluate not only the system's accuracy but also its fairness, transparency and integrity.

In virtual work environments, Jansson and Kangas (2025) showed that leaders' accessibility and continuous virtual feedback positively affect employees' acceptance of feedback. Frequent interaction helps compensate for the physical distance in the virtual working environment and fosters trust in the feedback source (Jansson and Kangas, 2025).

4.7.2.3 Desire to respond to feedback. Beyond feedback acceptance, characteristics of the feedback source also influence recipients' willingness to respond. Rivera *et al.* (2024) found that acceptance of virtual feedback positively influences an individual's desire to respond to virtual feedback. The feedback receiver's self-motivation to improve performance moderates this relation. Individuals with high self-motivation are more likely to view accepted feedback as an actionable opportunity for improvement and thereby exhibit a stronger desire to engage in performance-enhancing behaviors (Rivera *et al.*, 2024).

Consistent with these findings, Jansson and Kangas (2025) reported that leaders who actively give virtual feedback and encourage feedback-seeking behavior increase employees' willingness to use virtual feedback. Conversely, limited communication from supervisors reduces employees' motivation to seek and respond to the virtual feedback (Jansson and Kangas, 2025).

4.7.3 *Moderating factors on the cognitive processing of the feedback source.* The feedback channel moderates the relationship between the feedback source and the feedback sign. Feedback sources offered more negative feedback to team members via e-mail than via traditional paper-form methods. The study authors attributed this effect to decreased social obligation in the e-mail condition (Kurtzberg *et al.*, 2005). Further, anonymity leads feedback providers to reduce the length and subjectivity of their feedback to avoid potential reprisal. In contrast, identity disclosure directly increases the likelihood of longer, more detailed and more subjective feedback (Rivera *et al.*, 2024).

When examining the effect of the feedback source on response, researchers argue that a team's culture needs to be taken into consideration. Milliman *et al.* (2002) show that a team's culture moderates the relationship between a source providing constructive or critical feedback and the team's performance improvement. This relation is stronger when team members have an individualistic culture (compared to a collectivistic culture). In contrast, collectivistic cultures prioritize harmony and loyalty among team members; consequently, direct and critical feedback is perceived as inappropriate because it threatens group harmony (Milliman *et al.*, 2002).

Furthermore, Van Kleef *et al.* (2009) demonstrate that employees' epistemic motivation moderates the relationship between the feedback source's emotional display and team performance. Specifically, when the feedback source expresses anger, the positive effect on team performance is stronger in teams with high epistemic motivation. Conversely, when the

feedback source expresses happiness, the effect on team performance is more salient in teams with low epistemic motivation (Van Kleef *et al.*, 2009). Personnel Review

Since several moderators and mediators should be considered when communicating virtual feedback, Martínez-Moreno *et al.* (2015) propose creating guidelines for team leaders on providing feedback to team members.

4.8 Response

4.8.1 Individual response. Studies examined the direct effects of the stimulus on the response, which certain moderators and mediators had not yet explained. The literature indicates that virtual feedback promotes well-being because it serves as a key job resource that provides clarity and support, helping employees cope with uncertainty in a remote work environment (Mishima-Santos *et al.*, 2021). Further, diverse researchers demonstrate that virtual feedback enhances performance (Carter *et al.*, 2019; Petrucci and Rivera, 2018; Taylor *et al.*, 2022; Zhang *et al.*, 2022) and increases learning (Hsiao *et al.*, 2022; Feng *et al.*, 2021; Li, 2023; Barile *et al.*, 2023; Yu and Cai, 2022). In addition, virtual feedback improves idea generation and quality through diverse, constructive input, which strengthens and refines the feedback recipient's idea development (Zhu *et al.*, 2019). Virtual feedback enables individuals to assess areas for improvement, such as leadership behavior (de Vries *et al.*, 2004), and leads to desired behavioral changes (Biron *et al.*, 2023; Pan *et al.*, 2023; Petrucci and Rivera, 2018).

4.8.2 Team response. Researchers have noted that limited virtual feedback can lead to conflicts in teams when team members ascribe incorrect meanings to instances of silence due to delayed feedback (Kankanhalli *et al.*, 2006).

In response to conflicts related to virtual feedback, researchers found ways to mitigate these conflicts: Ayoko *et al.* (2012) argue that feedback-seeking behaviors help manage conflicts by increasing information clarity and ensuring that an individual's actions are not misinterpreted. Additionally, a feedback-friendly culture mitigates the challenges associated with accurately interpreting virtual feedback (Baker *et al.*, 2013). This is supported by Breuer *et al.* (2020), who found that team members' perceptions of a positive feedback culture enhance trust within teams. In teams with a high level of trust, members can provide both positive and negative virtual feedback constructively and respectfully, focusing their comments on work-related issues rather than on their colleagues' personal characteristics (Breuer *et al.*, 2020). In an experimental study, Peñarroja *et al.* (2015) emphasize that team trust mediates the effect of virtual feedback on improvements in group information elaboration and learning.

Table 3 summarizes the key relationships and dependencies identified in the literature on virtual feedback. It integrates empirical findings across virtual feedback characteristics, including feedback sign, frequency, immediacy, richness, availability, communication level and feedback source. Further, it demonstrates the effects of these feedback characteristics on the recipient's perceptions, acceptance, desire to respond and behavioral responses and identifies relevant moderating factors that influence these relationships.

5. Developing a research agenda moving forward

We addressed the literature on virtual feedback by connecting 114 articles through Ilgen *et al.*'s (1979) feedback process model. Our results demonstrate that previous works primarily addressed the complex feedback stimulus, the recipient's perception of the message and the effects of feedback at the individual and team levels. Nevertheless, other cognitive variables relevant to processing feedback, such as acceptance of feedback, desire to respond to feedback, intended response and external constraints, were either marginally addressed or not addressed in research. Figure 3 illustrates potential avenues for future research on virtual feedback.

Table 3. Key relationships, dependencies and findings identified in the literature on virtual feedback

Key relationships and dependencies	Synthesized key findings	Supporting studies
Positive virtual feedback sign influences perception of feedback, acceptance of feedback and response Moderators: Media richness, feedback culture, team identification and trust	Positive virtual feedback strengthens cohesion, collective efficacy, team identification, trust, collaboration, learning, feedback engagement and productivity. Positive virtual feedback fosters a close, friendly atmosphere and a supportive, collaborative team climate These benefits are amplified when feedback is delivered through rich media, embedded in a positive feedback culture and received by individuals with strong team identification	Newcombe and Ashkanasy (2002) , Kahai and Cooper (2003) , Sivunen (2006) , Schepers et al. (2011) , Mukherjee et al. (2012) , Sung and Mayer (2012) , Vinagre and Esteban (2018) , Breuer et al. (2020) , Mayordomo et al. (2022)
Negative virtual feedback sign influences perception of feedback, acceptance of feedback and response Moderators: Creative self-efficacy, mastery goal orientation and culture	Negative virtual feedback is perceived as less credible, as a sign of conflict and as potentially reducing trust. Perceived negativity of feedback can be perceived as surveillance and can decrease feedback acceptance. Nevertheless, negative virtual feedback perceived as constructive is likely to be accepted These effects are contingent on individual characteristics, such as creative self-efficacy, mastery goal orientation and culture (individualistic vs collectivistic)	Kankanhalli et al. (2006) , Golden et al. (2009) , Mukherjee et al. (2012) , Marler and Marett (2013) , Wang et al. (2014) , Jaakson et al. (2019) , Wong et al. (2021)
High frequency of virtual feedback influences perception of feedback, acceptance of feedback, desire to respond to feedback and response Moderators: Task type, motivation, willingness to seek and utilize the virtual feedback	Frequent virtual feedback improves performance, motivation, satisfaction, trust, cohesion, retention and teamwork skills. Frequent virtual feedback increases perceived effectiveness and availability of the feedback provider Constructive and frequent virtual feedback increases the feedback recipient's perception of feedback usefulness and motivates further developmental behavior	Kayworth and Leidner (2000) , Hertel and Geister (2005) , Geister et al. (2006) , Fan et al. (2014) , McLarnon et al. (2019) , Andrade et al. (2020) , Román-Calderón et al. (2021) , Depoo and Hyršlová (2022) , Rivera et al. (2024) , Jansson and Kangas (2025)
Low frequency of virtual feedback influences perception of feedback, acceptance of feedback and response	Infrequent feedback increases the likelihood of erroneous interpretations and misunderstandings and reduces self-efficacy, motivation and learning Infrequent feedback is perceived as a loss of social connection	Cramton (2001) , Hertel and Geister (2005) , Sardeshmukh et al. (2012) , Gerards et al. (2021)

(continued)

Table 3. Continued

Key relationships and dependencies	Synthesized key findings	Supporting studies
Immediate virtual feedback influences perception of feedback and response Moderators: media richness, work context	Immediate virtual feedback improves productivity, motivation and virtual team success. Immediate virtual feedback increases social presence, discussion satisfaction, group efficacy and reduces task completion time in virtual teams Immediate virtual feedback is perceived as useful for interpreting the feedback provider's emotional cues in a virtual working environment	Shepherd <i>et al.</i> (1995), Dennis and Kinney (1998), Kahai and Cooper (2003), Hertel <i>et al.</i> (2008), Powers <i>et al.</i> (2011), Fan <i>et al.</i> (2014), Raghuram <i>et al.</i> (2019), Shaik and Makhecha (2019), Chen <i>et al.</i> (2020)
Delayed virtual feedback influences perception of feedback and response	Delayed virtual feedback results in task conflict and increased frustration. Delayed feedback weakens social bonds and reduces trust among coworkers	Friedman and Currall (2003), Kankanhalli <i>et al.</i> (2006), Powers <i>et al.</i> (2011)
High virtual feedback richness influences perception of feedback, acceptance of feedback and response Moderator: Feedback immediacy	High virtual feedback richness provides multiple verbal and non-verbal cues, enables immediate interaction and enhances performance. High virtual feedback richness enhances perceived clarity and usefulness of virtual feedback	Dennis and Kinney (1998), Payne <i>et al.</i> (2009), Eisenberg <i>et al.</i> (2021), Yu and Schunn (2023), Cavalcanti <i>et al.</i> (2025)
Low virtual feedback richness influences perception of feedback, acceptance of feedback and response Moderator: Remote working environment	Low virtual feedback richness reduces an individual's self-awareness and may be perceived by the feedback recipient as cognitively demanding. When individuals perceive low virtual feedback richness, their turnover intentions increase	Weisband and Atwater (1999), Hebert and Vorauer (2003), Driskell <i>et al.</i> (2003), Sardeshmukh <i>et al.</i> (2012), Gutworth <i>et al.</i> (2023), Jansson and Kangas (2025)
Virtual feedback availability (feedback vs no-feedback condition) influences perception of feedback, acceptance of feedback and response Moderators: Culture, team composition	The availability of virtual feedback improves reflection, team cooperation, motivation, learning and well-being and reduces errors Further, the availability of virtual feedback changes how recipients perceive their own performance. The acceptance of virtual feedback depends strongly on its perceived usefulness	Henning <i>et al.</i> (1997), Kim <i>et al.</i> (2012), Konradt <i>et al.</i> (2015), He <i>et al.</i> (2017), Glikson <i>et al.</i> (2019), Mishima-Santos <i>et al.</i> (2021), Feng <i>et al.</i> (2021), Ouversen <i>et al.</i> (2021), Hsiao <i>et al.</i> (2022)
Virtual feedback on an individual vs team level influences response Moderators: psychological distance, team identification	Communicating virtual feedback at the individual vs team level has different effects on productivity, performance and task completion speed	Ouversen <i>et al.</i> (2021), Walton and Gilbert (2022), Kwasnitschka <i>et al.</i> (2024)

(continued)

Table 3. Continued

Key relationships and dependencies	Synthesized key findings	Supporting studies
Feedback source influences perception of feedback, acceptance of feedback, desire to respond to feedback and response Moderators: communication channel, source anonymity, culture, epistemic motivation	Feedback source characteristics influence feedback outcomes: demanding feedback promotes idea generation, whereas encouraging and empathetic feedback enhances creativity. Angry or negative emotional displays reduce perceived source competence, feedback quality, acceptance and willingness to use feedback. Acceptance of feedback increases when sources are perceived as psychologically close, accessible and trustworthy. Accepted feedback strengthens recipients' willingness to respond and improve performance	Milliman <i>et al.</i> (2002), Driskell <i>et al.</i> (2003), Kurtzberg <i>et al.</i> (2005), Van Kleef <i>et al.</i> (2009), Fan <i>et al.</i> (2014), Johnson and Connelly (2014), Wang <i>et al.</i> (2014), Rivera <i>et al.</i> (2024), Jansson and Kangas (2025)

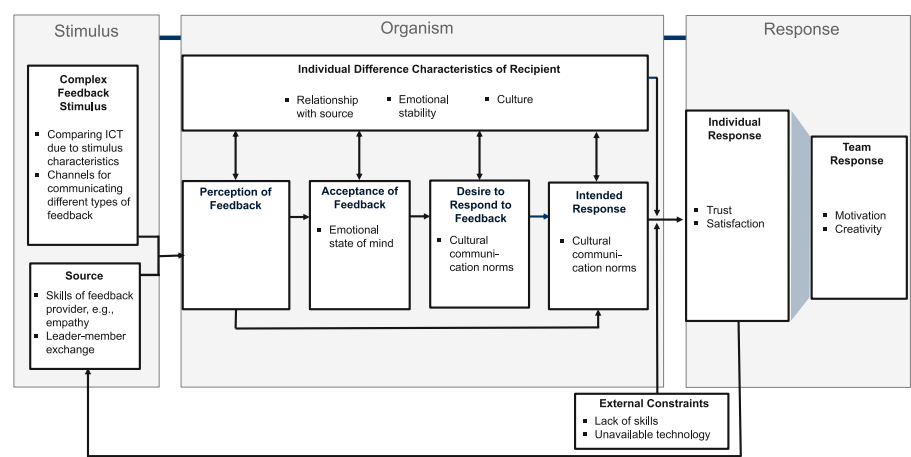


Figure 3. Future fields of research for virtual feedback

5.1 Addressing underexplored areas: cognitive processing of virtual feedback

5.1.1 Acceptance of feedback. Wang *et al.* (2014) and Driskell *et al.* (2003) argue that acceptance of feedback is a key variable in explaining the relationship between a complex feedback stimulus and an individual's response to virtual feedback. We encourage researchers to investigate individuals' acceptance of virtual feedback, as this is still an underexplored area. For instance, future research should examine how emotional reactions, such as frustration after corrective feedback or embarrassment at unexpected criticism, might mediate the relationship between feedback sign and acceptance of virtual feedback. As the mediating variables in the complex feedback stimulus–response relationship appear to be rationally constructed, we recommend considering an individual's emotional state and reactions to the received virtual feedback.

5.1.2 Desire to respond to virtual feedback and intended response. No academic article has examined how cultural norms and values influence an individual's desire to respond to virtual feedback and their intended response. Although several studies highlight that feedback is interpreted through social and contextual lenses (e.g. [Breuer et al., 2020](#); [He et al., 2017](#)), academic literature lacks empirical investigations into how cultural differences influence individuals' desire and intention to respond to virtual feedback in collaborative environments. Thus, our suggestion is to shed more light on how cultural communication norms, face-saving concerns and collectivist or individualist orientations shape the desire to respond to virtual feedback and intended response behavior.

5.2 Selection of adequate channels to communicate virtual feedback

When examining the complex feedback stimulus in greater detail, scholars have investigated the effects of the environmental stimulus, such as online performance appraisal systems vs traditional paper-and-pencil approaches (see [Payne et al., 2009](#)), on the recipient's reactions to feedback. However, comparing the effects of virtual feedback through diverse ICTs on an individual's cognitive processing of the feedback is uncharted territory. As some ICTs can be richer (e.g. metaverse, virtual reality and videoconferences) in communication than others (e.g. e-mail, chat) (see [Eisenberg et al., 2021](#)), it seems plausible to assume different effects of the complex feedback stimulus on the individual's processing of virtual feedback and reaction. Thus, we need more empirical investigations into the impact of virtual feedback through various ICTs on an individual's cognitive processing and response.

Hence, research should address several questions: Which ICTs should organizations use to communicate positively or negatively framed virtual feedback, increasing its acceptance and use by the recipient? What is the adequate timing and frequency for communicating feedback through various ICTs to be accepted? Which type of feedback (e.g. performance, process or developmental feedback) requires in-person or virtual communication to increase acceptance? Such insights enable scholars and practitioners to select contextually appropriate channels for delivering diverse types of feedback. Future research will guide scholars and practitioners in selecting channels for communicating feedback, especially in hybrid settings where employees work partially from geographically dispersed locations and partially from conventional office environments.

5.3 Algorithmic and AI-mediated virtual feedback

An emerging avenue for future research concerns algorithmic and AI-mediated feedback. As organizations increasingly integrate AI-supported systems into virtual work environments, feedback may no longer be provided exclusively by human actors but also by algorithmic tools ([Jarrahi et al., 2021](#); [Kellogg et al., 2020](#)). Therefore, future research should investigate how AI-supported feedback influences a recipient's perception, acceptance and behavioral responses. In particular, questions related to trust, transparency and perceived fairness of AI-generated feedback may extend existing knowledge of virtual feedback processes and contribute to the further development of virtual feedback in the workplace ([Newman et al., 2020](#)).

5.4 Skills of the feedback provider

While [Breuer et al. \(2020\)](#) note that the feedback provider should possess adequate skills to offer both positive and negative virtual feedback constructively and in a friendly manner, empirical insights into the specific skills involved remain lacking in recent research. Especially when individuals are more remote from the immediate social setting, skills for providing feedback effectively might need to be adapted to the virtual context. Thus, we encourage researchers to examine whether and to what extent the feedback source's skills in the in-person context, e.g. showing empathic concern when delivering feedback and

recognizing team members' emotional reactions as well as expressing understanding and care for team members' well-being when communicating feedback (Young *et al.*, 2017; Saunders and Ahuja, 2006) can be transferable to the virtual working context.

While a multitude of studies exist, we also urge replication studies to renew their validity, as technology has developed tremendously and users' experiences have changed dramatically, not least because of the pandemic (e.g. see Payne *et al.* (2009) examining employees' attitudes toward an online performance appraisal system).

6. Managerial implications

Academic interest in virtual feedback has grown markedly over the years. The literature suggests that virtual feedback has evolved from being viewed as an imperfect substitute for face-to-face feedback (Cramton, 2001; Payne *et al.*, 2009) toward being recognized as a distinct managerial mechanism whose effectiveness depends on the interplay of feedback characteristics, individual differences and contextual conditions (Ostrander *et al.*, 2020; Cavalcanti *et al.*, 2025).

In the pre-COVID era (1986–2019), scholarly perspectives often emphasized the limitations of digital communication, particularly regarding feedback richness. For instance, the perceived richness of a digital channel was closely associated with the immediacy of virtual feedback delivery (Dennis and Kinney, 1998). Telework arrangements, which typically lacked this immediacy, led to reduced communication and required employees to invest additional effort to access information, sometimes resulting in exhaustion (Ayoko *et al.*, 2012; Sardeshmukh *et al.*, 2012). Slow feedback cycles were also linked to misunderstandings (Siegel *et al.*, 1986; Cramton, 2001) and reinforced the perception that virtual feedback was of lower quality compared to in-person feedback (Payne *et al.*, 2009). In response, leaders adapted by establishing frequent feedback loops, which became crucial for building trust in virtual work environments (Jarvenpaa and Leidner, 1999; Kayworth and Leidner, 2000).

During the COVID era (2019–2022), perceptions of virtual feedback shifted, with many employees interpreting it as a form of monitoring or surveillance (Wong *et al.*, 2021). This interpretation was particularly detrimental to individuals with high creative self-efficacy but a low mastery goal orientation, as it could impede their creative output. Research also found that team-based feedback helped individuals to more accurately evaluate their own performance (Ostrander *et al.*, 2020). However, when such feedback failed to translate into observable improvements, recipients tended to view it as not useful (Ostrander *et al.*, 2020).

In the post-COVID era (2023–2025), researchers have highlighted several key advantages of virtual feedback, such as greater individual engagement and improved team performance (Cavalcanti *et al.*, 2025). At the same time, remote feedback continues to present notable challenges. Communication gaps often emerge due to the reliance on digital channels, and both giving and receiving negative feedback can be particularly difficult because of the heightened risk of misunderstandings (Cavalcanti *et al.*, 2025).

Core mechanisms underlying virtual feedback, such as feedback richness, frequency and immediacy, continue to play a central role, even as digital communication technologies have rapidly evolved (Geister *et al.*, 2006). Rather than rendering these foundational principles obsolete, contemporary ICTs have reshaped how virtual feedback is delivered, perceived, accepted and acted upon (Wong *et al.*, 2021; Cavalcanti *et al.*, 2025). Consequently, recent studies on virtual feedback largely extend the implications of earlier work, reinforcing the relevance of these mechanisms in increasingly digital organizational contexts.

Based on our review, we derive several implications for managing virtual feedback. In contrast to traditional face-to-face feedback, the following recommendations specifically address challenges arising from technology-mediated communication, including reduced social cues, varying media richness, asynchronous interactions and physical distance between feedback providers and recipients (Eisenberg *et al.*, 2021; Jansson and Kangas, 2025).

6.1 Choose adequate ICTs to communicate virtual feedback according to communication needs

We recommend that supervisors and team members select suitable ICTs to communicate virtual feedback that meets their specific communication needs. For example, whenever group discussions require a rich communication channel due to the need for immediacy of feedback, high group interactions and the need to view team members' reactions to comments in a synchronous manner, we recommend using media that is rich in cues, e.g. video conferencing (Eisenberg *et al.*, 2021; Yu and Cai, 2022). Such choices enable immediate verbal and nonverbal interactions, including facial expressions, gestures and tone of voice, thereby reducing the risk of misunderstandings and facilitating acceptance of feedback and desired outcomes. In contrast, email might be effective for communication that requires less coworker interaction and only asynchronous feedback (Sardeshmukh *et al.*, 2012; Yu and Cai, 2022).

6.2 Communicate virtual feedback frequently, concretely and promptly

Individuals in a virtual work environment should consistently, concretely and promptly provide feedback at both the individual and team levels. This is particularly important due to the disconnect among colleagues and the lack of rich face-to-face interaction inherent in virtual collaboration settings, where information about colleagues' goal achievement is more difficult to obtain (Jansson and Kangas, 2025; Raghuram and Wiesenfeld, 2004). Setting specific guidelines regarding feedback frequency, meeting times and discussion agendas is a solution (Leibold and Schwarz, 2022).

6.3 Provide virtual feedback constructively – whether positive or negative

Virtual feedback is crucial for managing and fostering individuals' creative performance in online collaborative environments (Wong *et al.*, 2021). When feedback is absent, individuals may miss opportunities for professional advancement, diminishing their motivation to showcase their creative potential. Wong *et al.* (2021) found that any virtual feedback (e.g. positive or negative) on performed tasks appears beneficial in an online collaborative environment. While Hoyt *et al.* (2007) show that negative feedback might lead to self-protective effects in the feedback recipient and thus not be accepted, we recommend providing both positive and negative feedback virtually. However, managers should be particularly cautious when communicating negative feedback via virtual channels, as the absence of nonverbal cues and contextual signals increases the likelihood of misinterpretation and reduces feedback acceptance (Jansson and Kangas, 2025; Eisenberg *et al.*, 2021). Whenever possible, negative feedback should therefore be communicated via richer media, such as video conferencing, and accompanied by clear explanations, opportunities for clarification and follow-up discussions. When managers constructively give feedback on a worker's poor performance, they foster a learning culture within an online collaborative environment (Wong *et al.*, 2021). For this logic to be effective, we emphasize that the recipient must perceive negative virtual feedback as benefiting them now or in the future (Anderson *et al.*, 2016).

6.4 Mitigate intercultural conflicts in culturally diverse teams

In culturally diverse virtual work environments, the absence of shared contextual cues and reduced opportunities for spontaneous clarification can amplify cultural differences in how feedback is interpreted (He *et al.*, 2017). Virtual communication channels provide fewer social signals than face-to-face interactions, increasing the risk that identical feedback messages are interpreted differently across cultural groups. Thus, there should be a way for employees to express their subjective interpretations of that feedback, thereby avoiding intercultural conflicts arising from misunderstandings. A helpful way to mitigate intercultural conflicts is to ask employees to share their reactions to the virtual feedback and explain whether they were satisfied with it and how they plan to implement it.

7. Limitations

Like any literature review, this work has several limitations that should be acknowledged to ensure transparency and enhance the credibility of the findings. First, although we followed a structured and systematic search procedure based on the PRISMA guidelines (Page *et al.*, 2020), elements of subjectivity inevitably influenced the process. This applies not only to the development and refinement of the search string but also to decisions made during the screening, selection and interpretation of studies. While we sought to mitigate these effects through clearly defined inclusion and exclusion criteria and iterative cross-checking, subjective judgment cannot be fully eliminated.

Second, the review is inherently constrained by the choice of databases. Our search was conducted in Web of Science, EBSCOhost and Google Scholar, which offer broad and reputable coverage but may not index all relevant publications in the field. While we used Google Scholar to reduce this bias, the limitation will remain.

Third, the review may be limited by language restrictions. Since our search strategy focused on English-language publications, research published in languages other than English was excluded. This may have resulted in the omission of relevant studies, particularly given the global nature of virtual feedback.

8. Conclusion

Researchers have addressed virtual feedback through various theoretical lenses over the past decades. Due to distortions in electronic communication and contradictory findings in the literature, virtual feedback might be processed differently by individuals than feedback communicated in person. To synthesize and comprehensively structure the disparate literature, we conducted a systematic review of 114 articles published between 1986 and 2025 in peer-reviewed academic journals in Business, Management and Psychology Sciences. Based on Ilgen *et al.*'s (1979) feedback process model and the SOR logic, we offer a theoretically grounded integration of virtual feedback that addresses the multidimensional nature of feedback and the process by which it influences behavior. Thus, we contribute to existing works revealing the aspects of virtual feedback that influence (a) the way it is perceived, (b) its acceptance by the recipient, (c) the willingness of the recipient to respond to the feedback and (d) the recipients' response. This context-specific application of Ilgen *et al.*'s (1979) feedback process model provides a comprehensive understanding of an individual's reaction to virtual feedback, demonstrating which elements of the model are examined in the virtual context and which still require further investigation. Furthermore, we uncover several underexplored constructs that are central to a comprehensive understanding of an individual's reaction to virtual feedback. By integrating fragmented findings, identifying critical research gaps and outlining a forward-looking research agenda, we lay the groundwork for developing a more comprehensive and empirically grounded understanding of virtual feedback, one that is essential for both scholars and practitioners.

Supplementary material

The supplementary material for this article can be found online.

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