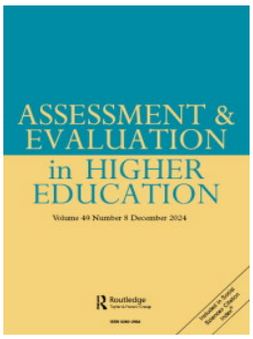

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Evaluative feedback isn't enough: harnessing the power of consequential feedback in higher education

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ABSTRACT

Most research on feedback in higher education focuses on evaluative feedback and its recipience, uptake, and enactment. Evaluative feedback information includes judgments, critiques and suggestions for improvement provided by a teacher, peer, self, pre-programmed automatic feedback, or artificial intelligence tutoring systems. In contrast, we elaborate the neglected concept of consequential feedback. Consequential feedback offers information about the natural effect (consequence) of an action, such as getting burned when touching a hot stove, eliciting a laugh (or not) from a comedy routine, or the trajectory of a newly designed model rocket. This information is available during (simulated) professional/disciplinary/social practice when using professional or disciplinary tools or systems (e.g. stoves), audiences, clients, or products (e.g. comedy routines or rockets). We discuss how this concept builds on and extends the literature on feedback in higher education. We draw on examples from the health professions, business, mathematics and the arts to illustrate how we can harness the power of consequential feedback to create more impactful feedback. We centre educational simulations, first considering how non-human actors offer consequential feedback and then how human interactions embedded in role plays present consequential feedback. We conclude by exploring implications for research and practice.

KEYWORDS

Feedback; higher education; consequential feedback, evaluative expertise, feedback literacy

Introduction

Discussions about feedback and assessment have dominated higher education research in the last 15 years (Sun et al. 2024). The focus has largely been on evaluative feedback information: the criticism and suggestions that educators and peers give on students' work or performance and how students seek, understand, receive, and take up that feedback (Winstone et al. 2021). In this paper, we seek to broaden researchers' and practitioners' attention to include consequential feedback information (Annett 1969; Smith and Ntuen 1999; Quinlan and Pitt 2021). Consequential feedback is information about the effect of an action, such as the effect of a given treatment on a patient, of a design choice on a product's effectiveness, or of a communication move on the resolution of an interpersonal conflict.

Practitioners must attend to how effective their actions are in creating their intended outcomes so they can adjust and continually improve. Therefore, students must learn how to learn

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from the consequential feedback available when engaging in real or simulated professional and disciplinary practice. These complex professional, disciplinary or social situations involve processes, contexts, practices, tools, or challenges faced by practitioners of a profession or discipline. Of course, in these complex contexts, there may be many situational, social or material determinants of the outcome that are beyond the control of the practitioner (Dean and Sykes 2021). We focus attention on helping learners notice, interpret, learn from and adjust their actions based on consequential feedback information. Doing so requires discerning and reflecting on cause-effect relationships in complex, socially and materially entangled practices.

Feedback has been described as 'processes where the learner makes sense of performance-relevant information to promote their learning' (Henderson et al. 2019, 268). First, this broad definition implies that performance-relevant information (feedback *information*) may be available to learners through formal assessment tasks (whether formative or summative) or during various non-assessed classroom or work-based activities. Second, information can come from a variety of sources. Third, the performance might be their own or that of another person. Traditionally, educators were seen as feedback providers while students were seen as feedback receivers (Winstone and Carless 2019). Recent attention has been paid to the role that peers can play (Panadero et al. 2023) and students themselves (Yan et al. 2023). To be effective, educators need to create opportunities for students to experience and learn from different sources and forms of feedback that are tied to their discipline (Quinlan and Pitt 2021; Pitt and Carless 2022).

Quinlan and Pitt (2021) called attention to other feedback information sources, such as objects, by distinguishing evaluative feedback information from consequential feedback information. This distinction was drawn in much earlier feedback literature (e.g. Annett 1969), and educators near the end of the twentieth century (Smith and Ntuen 1999) noted that it had not yet been well-addressed. That gap still exists. Educators and peers primarily offer evaluative feedback, in which the information provided typically takes the form of judgments, corrections, criticisms, or suggestions for enhancement, whether in written or verbal form. Quinlan and Pitt (2021) proposed that consequential feedback is an equally important, yet largely overlooked, source of feedback information. Consequential feedback is information *about* the *effect* of the learner's performance or action (Annett 1969; Smith and Ntuen 1999; Quinlan and Pitt 2021;). The term could be misread as referring to the consequences *of* feedback on students' subsequent performance. However, that idea is already well-addressed by notions of feedback uptake (Carless and Boud 2018) and enactment of feedback (Pitt and Quinlan 2022).

Instead, consequential feedback is defined as the information available to students by observing what happens as a consequence of their own (or another's) action – that is, information *about* real world consequences. For example, in healthcare, when the goal may be to respectfully take a thorough medical history to inform a diagnosis, students pose questions (action) and can observe effects (consequences) such as the patient's responses, including body language and the quality, thoroughness, and relevance of the medical history elicited. These effects offer consequential feedback information about the effectiveness of the student's history-taking. Coupled with reflection in- or on-action (Schön 1983), learners can use consequential feedback information to refine or question the knowledge base, theory, assumptions, or reasoning process that led to their action. Harnessing the power of consequential feedback information can promote a variety of twenty-first century competencies, including critical thinking, decision-making, systems thinking, anticipatory thinking, strategic thinking, self-awareness, and normative competencies (UNESCO 2017). Attention to actions and their effects are central to all these educational aims, which are particularly relevant to work-integrated learning and simulations of workplace practices.

In this paper our initial focus is on first person or 'primary' consequential feedback information, in which students themselves act, generating consequences. The shorthand, then, is 'I did x, which led to y'. Students can also learn through observation of others' actions and the consequences of those actions, which we call secondary consequential feedback information. Thus, secondary consequential feedback information can be summarised, 'You did x, which led to y'. or

'They did x, which led to y'. Secondary consequential feedback is particularly important in collaborative learning, role playing and peer feedback situations in which students can observe other students' performances and the effects of their actions. Educators can also harness secondary consequential feedback explicitly through thoughtfully designing demonstrations and then pointing out: 'See how I did x and y happened?' or 'See how your peer did x and y happened?'

In this paper, we will first use simple examples to show how consequential feedback information is a key component of feedback. Following Henderson et al.'s (2019) definition of feedback, learning or action must occur from this information to make it 'feedback'. Action-consequence (or stimulus-response) pairings are key elements of a variety of learning theories, though the way learning is assumed to occur from this form of information varies across theories. We will first show that the action-consequence sequence is a vital form of feedback information and, therefore, a key part of the feedback process. Labelling and explicating it allows us to focus on our main aim of helping educators to design consequential feedback information into instruction and develop processes to help students notice it, reflect on it and use it to change their future practice (i.e. take it up or enact it). Understanding this type of feedback also addresses our second aim of stimulating researchers to analyse how to use it most effectively to promote learning. We will briefly connect consequential feedback information to different learning theories. However, we argue that to make best use of consequential feedback information in complex professional and societal situations we must draw on theories of cognitive and socio-material learning as they apply to feedback and the development of students and teachers' feedback literacy (Carless and Boud 2018; Boud and Dawson 2023; Carless and Winstone 2023). Thus, we will make these important links in the second part of the paper. Third, we will explore a variety of examples of assessments from a range of fields. We divide these examples into two broad categories: computer-aided simulations and role plays between human actors. Finally, we will draw out implications and next steps for practitioners and researchers.

Consequential feedback in context

Consequential feedback is ubiquitous in human experience and constitutes a key source of information from which people learn long before they enter educational institutions. Imagine a small child who touches a hot stove (the action or cause) and is burned (consequence or effect). The immediacy of the burned finger (effect) is associated with touching the stove (action). The child learns that touching a hot stove will cause a burn and avoids doing so again. They have learned (the hard way!) from consequential feedback information. In time, through combinations of explicit instruction, evaluative feedback from caregivers, observing more experienced others (secondary consequential feedback), and, possibly, more trial and error (i.e. further primary consequential feedback), they will learn how to handle hot things safely.

In this simple example, it is difficult to separate the consequential feedback information itself from the learning. In fact, behaviourists (Skinner 1963) called learning in which voluntary behaviours are influenced by their consequences operant or instrumental conditioning. Behaviourists see the association between the stimulus and response itself as the learning, not the mental processing or reflection on the association between the behaviour and its consequence. However, in the complex, real-world contexts for which higher education prepares students, it is more useful to distinguish the consequential feedback information (these action-consequence connections) from the learning process so we can analyse and test different teaching approaches that will promote learning from this type of information. Taken together – the consequential feedback information and the mental processing – yields feedback (Henderson et al. 2019).

When students are learning a profession or a discipline they must learn the natural consequences of many new behaviours. Explicitly highlighting consequential feedback information is important in higher education because cause-effect chains at the heart of consequential

feedback are often hard to identify in the complexity of professional life. Among the myriad of actions and consequences, which is most salient? Which action has been instrumental to which outcome? Was a positive outcome simply the result of luck or chance? Not only are many things often happening simultaneously, but effects may be delayed. For example, if hospitals fail to clean surgical tools properly, patients will likely develop an infection hours or days later. Here we recognise the situatedness of learning, drawing on socio-cultural (Collins, Brown, and Holum 1991) and socio-material views of learning, assessment and feedback (Fenwick 2016). Furthermore, once the vital cause-effect relationship is recognised, students may still not know how to adjust their actions to yield a better result.

Some learners may need more help through the reasoning process that connects the action to the consequence and then adjusting their actions. That is, their feedback literacy may not be as developed (Molloy, Boud, and Henderson 2020) as others when it comes to reading, interpreting and responding to these cause-effect chains. Likewise, some educators' feedback literacy may be more developed, helping them to set up demonstrations and helping students to read, interpret and act on this consequential feedback information (Boud and Dawson 2023). In the next section, we explore how current conceptualisations of learning from feedback apply to and need to be adapted or expanded to address consequential feedback.

How does consequential feedback relate to current conceptualisations of learning from feedback?

Evaluative judgment

For students to achieve autonomy from their educators, Sadler (1989) stressed the importance of 'evaluative knowledge' and 'evaluative expertise', in which learners understand what constitutes quality in a task and how their own performance compares to a standard. Being able to make quality judgements helps learners understand and decode evaluative feedback they receive, bridging the gap between their current performance and the intended performance. More recently, this process has been conceptualised as evaluative judgement (Tai et al. 2018). Students exercise evaluative judgement when evaluating their own or peers' work against preset criteria or standards. The concept of evaluative judgment is vital to learning from consequential feedback but requires us to distinguish process (action/cause) from product (consequence/effect), which is not always explicit in discussions of assessment and feedback.

Evaluative judgment focuses on appreciating the gap between intended and actual performance. To improve the outcome of professional actions, learners need to build evaluative judgement of both *process* and *product*. Learners first need to notice the consequence of an action and judge whether it was desirable. Did it achieve the intended outcome? Did it meet acceptable quality standards? If a student builds a model rocket and launches it, they first need to observe the trajectory of the rocket (product). That is, they need to develop evaluative expertise regarding desirable rocket trajectories. If the rocket launch was disappointing, they need to trace back to look at the processes (actions) preceding it. A process of troubleshooting ensues. They must develop evaluative expertise regarding this process and, possibly, multiple steps in that process. For example, they will need to be able to evaluate the shape of the rocket, the materials and their weight and durability, and the fuel they use. Thus, evaluative judgment is doubly important in interpreting and acting on consequential feedback.

Tai et al. (2018) argued that evaluative judgement could become unconscious or implicit when students have become proficient within a particular context. Through our conceptualisation of consequential feedback, we seek to make implicit processes explicit. Doing so is important to draw both educators' and learners' attention to a vital source of feedback information. Learning from consequential feedback information in professional settings to achieve the kinds of educational outcomes expected of higher education (e.g. strategic thinking and decision-making),

typically requires conscious cognitive, emotional and ethical processing of consequential feedback information.

Self-generated feedback

Becoming adept at noticing, 'reading', interpreting, drawing conclusions from, and adjusting performance based on such observations is vital to independent learning. Here we follow Nicol (2021) who has emphasised students' central role as active agents in the feedback process. He called that process 'inner feedback', though his conception is only one in a wider landscape of 'self-generated feedback' (Panadero, Lipnevich, and Broadbent 2019). He theorised that a student interprets feedback-related information, engages in conscious internal comparative processes, and articulates relationships to their own learning.

While we would characterise the internal processes more broadly than Nicol to include emotional processing as well as cognitive processing, we agree that students' role is central to the effectiveness of consequential feedback processes, especially as there may be no educator present when this feedback information becomes available. We assume that students must generate their own self-feedback (Wood and Pitt 2024) about how to adjust their actions to improve their performance. We extend Nicol's discussion, though, by broadening the information learners might attend to; specifically, we focus on attending to the links between causes and effects. Those effects may be observed in objects (e.g. the quality of a radiograph Esterhazy, De Lange, and Møystad 2021) or in people's reactions.

Nicol (2021) has suggested that students engage in this inner feedback process naturally, following limited teacher prompts, prior to requesting teacher feedback (Nicol and Kushwah 2024). It may be that this tendency is in-built, just as the ability to learn from direct stimulus-response sequences (e.g. the child touching something hot and learning not to do so again) is innate. But in complex tasks in complex settings, we also argue that the educator is vital in helping students learn (and learn how to learn) from consequential feedback information. Educators can use thoughtful design of demonstrations and simulations as well as carefully planned prompts that help students notice, interpret and adjust their understanding, assumptions, reasoning and actions. For that we rely on a slightly broadened notion of teacher feedback literacy, which we discuss below. Thus, self-generated feedback, like evaluative judgment, is a key concept that, when interpreted more broadly, describes in more detail what may be happening in the 'noticing' and 'interpreting' steps of the consequential feedback cycle.

Emphasising student self-generated feedback or learner agency in feedback is partly seen as an antidote to overburdening educators with requests for feedback (Nicol and Kushwah 2024). However, consequential feedback does not necessarily depend upon teacher-student or even peer-to-peer dialogues. Thus, a greater awareness of consequential feedback and educational designs that capitalise on it is another solution to this problem.

Student feedback literacy

Student feedback literacy refers to students' 'understanding, capacities and dispositions needed to make sense of information and use it to enhance work or learning strategies' (Carless and Boud 2018, 1315). Their framework proposed four components: *appreciating feedback processes; making judgements; managing affect; and taking action*. Our conception of learning from consequential feedback also requires these four components.

Subsequent work on feedback literacy explicitly added an acknowledgement of feedback as a reciprocal process (Molloy, Boud, and Henderson 2020). Thus, more recent research on student feedback literacy has concentrated on students' feedback-seeking behaviours (Molloy, Boud, and Henderson 2020; Dawson et al. 2024), which has been defined as 'the pro-active search for

evaluative information about performance' (italics added) (Leenknecht and Carless 2023, 1). Likewise, Dawson et al.'s (2024, Appendix A) Feedback Literacy Behaviour Scale also defines feedback-giving in terms of 'making comments about its [the work's] quality'. Most of the items in this newest survey of feedback literacy refer to feedback information as 'comments', which largely excludes many valuable forms of consequential feedback, particularly that which comes from machines, computers or other objects. Only three items are broad enough to encompass consequential feedback information ('I reflect on the quality of my own work and use my reflection as a source of information to improve my work' and two of the managing affect items: 'I deal well with any negative emotional responses I have to feedback information' and 'When a feedback message is valuable but upsetting or annoying, I still find a way to make use of it') (Dawson et al. 2024, Appendix A).

Earlier instruments to assess feedback literacy also tended to focus primarily on evaluative feedback in the form of eliciting, processing or responding to comments and suggestions from others (e.g. Zhan 2022). Thus, while the broad categories theorised as comprising feedback literacy are applicable to consequential feedback, the operationalisation of the term has focused almost exclusively on a conception of feedback as evaluative rather than consequential. Thus, fleshing out consequential feedback is vital to enriching our understanding of and pedagogical support for students' feedback literacy.

Teacher feedback literacy

Researchers have also sought to define teacher feedback literacy both conceptually and empirically (Boud and Dawson 2023; Carless and Winstone 2023). Boud and Dawson's (2023) framework includes 19 key themes across macro, meso, and micro levels. Many of these themes, described broadly, are relevant to and can encompass consequential feedback. For example, at a macro level, educators can plan feedback strategically and create feedback-rich environments that simulate professional or disciplinary practices. Building greater awareness of the potential of consequential feedback will support educator feedback practice. At a meso level, educators can attend to timings, locations and sequencing of feedback, which could include self-assessment in conjunction with consequential feedback. They can also frame feedback information in relation to standards and criteria and use technologies to aid that process. As we will see in the next section, technology can be a key source of consequential feedback information. At a micro level, educators can consider appropriate ways of crafting input to students and providing differentiated support to students in learning from consequential feedback information. Likewise, they need to become proficient at appropriately complementing consequential feedback with corrective feedback. We will see examples of some of these different strategies in the next section.

Consequential feedback in computer-based simulations

Consistent with Quinlan and Pitt (2021) characterisation of consequential feedback as part of disciplinary 'signature assessment and feedback practices', we draw on examples from discipline-specific pedagogical literature. Doing so demonstrates the wide-ranging applicability and relevance of this concept. Readers may find the concept easier to understand and apply when they see examples from their own field. We have selected examples where published literature addressing the concept already exists, though not necessarily by this name. Although examples tend to be in fields that are directly aligned with specific professions, consequential feedback is also relevant to a wider range of disciplines. Some fields might use scenarios drawn from professional practice (e.g. psychology) or may seek to simulate real-world disciplinary practices such as debates between schools of philosophy (philosophy) or testing scientific theories through experiments and observing and interpreting the results (Swanson and Clarke-Midura

2021). We start with examples of how physical objects or computers used in educational simulations offer consequential feedback because we believe it is simpler to distinguish between evaluative and consequential feedback in these settings. We then move on to simulations that involve human actors.

Health professions

Medical simulations often use mannequins as simulated patients that are connected to typical medical data displays such as heart rate monitors. Observing changes in the vital signs of a mannequin in response to interventions allows students to reflect and make informed decisions to aid the 'patient', thereby refining their clinical skills through continuous evaluation and adjustment (Lateef 2010). This consequential feedback is central to the simulation experience. However, consequential feedback alone may not be sufficient.

In an experiment using post-simulation training sessions to teach cardiopulmonary resuscitation (CPR), Paloncy (2020) used the computerised feedback afforded by a high-fidelity emergency cardiovascular simulation that measures actual rate, volume, and force of the ventilations delivered to the mannequin. These key performance indicators offer consequential feedback not available through the more commonly used low-tech Resusci-Anne (a full body CPR mannequin used to train first responders in basic life support techniques). Paloncy (2020) demonstrated that focused corrective feedback is needed to capitalise on this vital consequential feedback.

In a randomised controlled trial, she compared CPR skills of students under two conditions. The control group participated in a standard short, high-fidelity real-time cardiovascular emergency simulation with a standard debrief. The simulator provided real-time records of consequential feedback on key performance indicators that the facilitators used to guide the feedback debrief. The debriefing session included a discussion about what was done well, what went poorly, and what the learners could change in future clinical situations to improve outcomes. The experimental group did the same simulation and debrief, followed by a 15-minute supervised practice. Across a range of indicators, the average performance in the first simulation was 19% for both groups (compared to 75–100% for advanced performers and 50–75% for intermediate performers).

Too often, learners are unable to maintain the correct depth and rate of chest compressions, leading to poor scores. The additional training session was meant to correct that problem. As the student practiced on the mannequin, the trainer used the real-time consequential feedback readings from the simulation software to provide corrective feedback on key component skills such as hand placement, compression depth, timing or forcefulness of ventilation to ensure adequate lung volume was achieved. The (secondary) consequential feedback on students' performance allowed the teacher to tailor their corrective feedback to the student, teaching the specific skills the student needed to employ to achieve the intended result. The continuous consequential feedback provided by the machine allowed the teacher to immediately judge and convey to the student (through evaluative feedback) the effectiveness of changes the student was enacting. Thus, the comments provided by the teacher were evaluative (corrective) but informed by consequential feedback. Two weeks later, students in the control condition performed no better in the simulation than they had the first time (with average scores of 17%). Students in the experimental condition who had also participated in the supervised skills-training practice session scored an impressive 72%.

While the International Nursing Association for Clinical Simulation and Learning guidance indicates that either a debriefing or supervised practice should follow a simulation, Paloncy (2020) demonstrated that a debriefing alone was insufficient for students to adjust their physical behaviours. The high-tech simulator's specific, immediate consequential feedback about the patient's lung volume enabled the instructor to judge the effectiveness of students' actions and teach them how to adjust their actions to achieve effective outcomes. Students could then

experience how it feels to do it correctly, allowing them to subsequently apply the new skills. In short, the instructor's use and interpretation of the consequential feedback information to guide tailored corrective feedback information was most effective. Students appear not to have had direct access to the consequential feedback, thus we do not know whether they could have eventually learned directly from it.

Business

Multi-round computer-based simulations are growing in popularity in business schools to teach topics such as marketing and logistics. Simulations afford experiential learning opportunities that allow students to gain deeper understanding of the complexity of supply chain issues, decisions and trade-offs in realistic scenarios. To optimise the effectiveness of these simulations, it is vital that simulations and their assessment, particularly game-based simulations, be aligned with the intended learning outcomes. Typically, these simulations provide consequential feedback about the effects of a behaviour or input but not corrective feedback suggesting actions the students should take.

In a qualitative study, Brazhkin and Zimmerman (2019) traced students' learning through a series of five rounds of play with a team-based simulation, *The Fresh Connection*, to determine what and how students learned through the process. The game's goal was to improve the profitability of a struggling manufacturer. The game became progressively more difficult with each round as participants took turns playing the Vice President (VP) for Purchasing, VP for Operations, VP for Supply Chain Management, and VP for Sales. The game generates individual role scores based on role-specific key performance indicators (KPIs) such as lowest purchasing cost for the VP Purchasing, as well as scores on team KPIs such as returns on investments (ROI). These KPIs are often used as part or all of the students' marks/grades. However, as students in Brazhkin and Zimmerman's (2019) study quickly noticed, high individual performance indicators did not necessarily combine to yield strong team performances. In successive rounds of the game, students' trial-and-error changes gave way to reasoned decision-making, stronger communication and shared strategising.

Brazhkin and Zimmerman (2019) emphasised that assessment needs to focus on the intended learning outcomes, including strategic, reasoned decision-making, appreciation of cause-effect relationships, planning and data analysis, and effective communication and collaboration within the team. They assessed these goals through student written reflections after each round of play, in which students self-generated (Nicol 2021) corrective feedback.

Individual performance indicators and even team scores (e.g. ROI) generated by the simulation itself (e.g. consequential feedback) do not offer corrective feedback toward these higher order learning outcomes on their own. Mismatches between achieving positive individual KPIs or 'winning the game' and intended learning outcomes may account for the mixed effects of game-based simulations in marketing on student learning (Van Esch et al. 2020). Students may be too focused on 'winning' or 'losing' the game, rather than the strategies they are meant to be practicing.

While Paloncy's (2020) study highlighted how instructors can generate powerful corrective feedback based on consequential feedback, Brazhkin and Zimmerman (2019) highlighted how students can be prompted to generate their own corrective feedback through repeated trial and error, reflection on, and communication about consequential feedback information. Repeated cycles of noticing, interpreting, then strategising and fine-tuning approaches as well as careful data analyses were all needed to make best use of the consequential feedback provided by the simulation, enabling students to engage in more effective business management.

Mathematics

Gresalfi and Barnes (2012) examined how consequential feedback affects mathematics learning in the online game Quest Atlantis (www.questatlantis.org). Students used avatars to navigate a

virtual world where they encountered an injured eagle. They had to plan a route, calculate fuel needs, and handle other tasks to save the bird using a flying machine. The game provided consequential feedback based on their decisions: wrong calculations led to crashes and the eagle's death, mediocre solutions resulted in the eagle's wing being amputated, and optimal solutions saved the eagle completely. If students miscalculated the amount of fuel needed for a rescue mission, they witnessed their virtual ultralight crashing, which underscored the importance of accurate mathematical reasoning (Gresalfi et al. 2009). This consequential feedback information demonstrated the real-world impact of their choices.

The study found that offering consequential feedback significantly improved students' problem-solving skills. Students who received such feedback showed a much higher level of consequential justification, considering the relationship between their mathematical calculations and the story's outcomes five times more frequently than the previous year without such feedback. Moreover, these students demonstrated a significant increase in mathematical justification, with the rate more than doubling compared to the previous year without the game. This finding indicates that consequential feedback not only helps students understand the real-world impact of their decisions but also enhances their ability to justify their mathematical reasoning.

Gresalfi and Barnes (2012) demonstrated that consequential feedback significantly enhances students' problem-solving skills by highlighting the real-world implications of their mathematical calculations. This feedback provides a formative learning experience, prompting students to understand and justify their decisions. For example, when two students received different outcomes – one with an eagle's wing amputated and another unscathed – they re-calculated route times, engaging deeply with ratio mathematics. Therefore, consequential feedback in the context of a real-world scenario encouraged students to correct errors and critically consider how their mathematical decisions lead to different outcomes, increasing engagement with content and instances in which they justified their decisions.

Consequential feedback in human interaction role-plays

Human actors, who might be educators, peers or service users, often blend evaluative and consequential feedback. Thus, simulations (role-play) in which consequential feedback is offered by humans are more complex to analyse. We know that higher education students often do not recognise even the evaluative feedback that is embedded in instructional interactions (Heron et al. 2023). Thus, it may be even more difficult for them to recognise consequential feedback embedded in human interactions.

Simulated patients in medical education

In the previous section, we considered medical education simulations that involve mannequins. Sometimes, though, the simulated patient is a real human, not a mannequin. Role-playing scenarios with professional actors simulating patients offers valuable consequential feedback. The actors' responses to treatment plans provide students with critical insights, aiding the refinement of their clinical skills and understanding (Dawson, Carless, and Lee 2021). Increasingly, real patients are participating in medical education as patient-educators (Dijk, Duijzer, and Wienold 2020). Because patient-educators are often trained to serve as teachers, including giving feedback, making the distinction between corrective and consequential feedback may clarify the unique contribution of patient-educators in medical education.

Creative writing workshops

The signature assessment (Quinlan and Pitt 2021) of creative writing pedagogy, the classic Iowa Writer's Workshop model, involves a small group of students reading the work of one member

before the workshop, coming prepared to discuss its strengths and weaknesses and then discussing it while the author is prevented from speaking by the 'gag rule' (Glatch 2024). This model has faced criticism for fostering a toxic environment through overly critical evaluative feedback. Though various reasons for this toxic environment have been proposed (Williford 1998; Kearns 2009), we contend that a lack of explicit attention to the distinction between evaluative (including corrective) and consequential feedback may contribute to the problem.

Williford (1998) advocated for more 'descriptive' rather than 'prescriptive' feedback to create more democratic workshops. Rather than criticising or praising the work, he asked students to describe the stories they read, noting how the text lands for them and voicing questions it raises. This approach provides consequential feedback information by putting peers in the role of a lay reader reading for pleasure or interest not a literary critic reading to evaluate it, allowing authors to hear how their work is received. This consequential feedback reveals whether the intended meaning or intent is clear and whether it achieves the intended artistic impact. Often, as in the case of poetry, 'poems move you – that's what they are for. The famous English poet Philip Larkin also said poetry begins with emotion in the poet, ends with the same emotion in the reader, and the poem is the instrument that puts it there'. (Padel 2002, 18). Consequential feedback information illuminates whether the emotion readers report is what the poet felt and sought to convey. The 'gag rule' helps authors see their work through readers' eyes and hearts without intervening, positioning attendees as potential lay readers whose interpretations can be invaluable.

While 'prescriptive' (evaluative or corrective) feedback may be rooted in consequential feedback (i.e. the effect of the writing on the feedback provider or their observations of the effect on others), distinguishing between initial consequential and subsequent evaluative, corrective (prescriptive) feedback is important to enhancing the feedback process. First, the same feedback provider can wear two different hats: consequential feedback information provider ('I felt wistful') and evaluative feedback information provider ('the references to autumn leaves falling contributed to the effect'). Some people are better positioned to provide one or the other type of feedback information, depending upon their similarity to the intended audience of a work and their level of subject expertise. Second, the focus on consequential feedback changes the tone, emphasises specificity and close reading, and values differences between readers. Finally, consequential feedback information enables the author to decide whether the work is being interpreted as they intended and allows them to generate or seek their own corrective feedback specifically for the problems they want to address in the writing. Most importantly, naming and practicing consequential and evaluative feedback as discrete entities enables learner-authors to ask for the kind of feedback they want, promoting their ownership and responsibility in the feedback process (Molloy, Boud, and Henderson 2020).

Glatch's (2024) advice on workshop feedback includes descriptive (consequential) feedback but doesn't explicitly distinguish between feedback types. His guidance aligns with common sense in evaluative feedback, such as offering praise and being constructive. Likewise, his advice for feedback receivers is consistent with literature on feedback literacy in higher education that focuses on learning from evaluative feedback (Carless and Boud 2018; Molloy, Boud, and Henderson 2020). However, he also echoes Williford's (1998) emphasis on peers sharing their experiences of the writing, helping authors understand their work's impact. He suggests that authors gain the most from (descriptive/consequential) feedback when the peers in the workshops are closest to the intended readers of the work. While there is some awareness of the different types of feedback (evaluative/corrective/prescriptive versus descriptive/consequential), feedback literacy of both teachers and students could be improved with more explicit discussion of descriptive/consequential feedback.

Creative arts

When students are learning a profession, understanding the natural consequences of new behaviours is essential. As with creative writing, creative performing arts uses a distinctive

pedagogical approach to cultivate signature feedback practices aimed at developing student feedback literacy (Pitt and Carless 2022). These practices, such as public performances and peer evaluations, are crucial for the learning process, helping students gain a deeper understanding of their own work and that of their peers (Gielen and De Wever 2015).

In the performing arts, public audience reactions provide consequential feedback. Immediate responses, like applause, or the lack thereof can help students gauge the effectiveness of their performances and make adjustments (Quinlan and Pitt 2021; Pitt and Carless 2022). A supportive learning culture encourages open dialogue, allowing students to share their work-in-progress and receive both evaluative and consequential feedback.

Pitt and Carless (2022) studied first year students and their educators in creative arts sub-disciplines at a UK university. Here we focus on Comedy as an example of productive use of consequential feedback. Students were assessed through final performances, making up 65-75% of their grade. They iteratively developed their work, receiving feedback through ongoing work-in-progress sessions. The collaborative learning environment emphasised the public nature of feedback.

Feedback was often evaluative, offering praise, criticism, and suggestions mirroring practices described in Glatch (2024). While evaluative feedback was familiar, educators worked to help students understand consequential feedback by engaging with audiences. Consequential feedback focused on audience responses, simulating real-world experiences through mock audiences. Educators encouraged students to express their reactions to peers' performances, enhancing their understanding of the impact on the audience, with clear evidence that such descriptive (consequential) feedback benefitted them (Williford 1998). To increase the impact of consequential feedback, the term ended with sessions involving a different audience.

Given that personal investment in one's work can hinder objective self-assessment, it is important that students learn to recognise and make use of feedback, especially about weaknesses in their practice. Learning from consequential feedback is a vital tool in that development.

Conclusion

In this paper, we have developed the concept of consequential feedback. A summary of its key propositions in relation to enhancing feedback is provided in Figure 1. The figure, designed as a concept map, should be read from the top of the figure by following the arrows. The figure defines consequential feedback information. It proposes what learners need to do with consequential feedback information to learn from it (notice, judge the effectiveness of the action, generate and/or seek corrective feedback and change their actions). It also proposes how and where in the process educators can assist learners (e.g. by designing situations that offer consequential feedback information, helping students to notice the links, judge their effectiveness and by offering relevant corrective feedback). Each link between a concept box and the next concept box constitutes a separate proposition that can be examined in subsequent research.

The examples and research cited above illustrate the diverse situations in which consequential feedback can foster student learning and have informed the development of this model. However, most existing research on feedback in higher education focuses (often implicitly) on evaluative feedback. In Figure 1 and through the examples above, we have shown how consequential feedback may underpin and inform the subsequent generation of evaluative feedback. Naming, theorising, evaluating and intentionally designing for learning from consequential feedback has the potential to broaden the field's approach to feedback enhancement.

Drawing together examples from disparate disciplines under a single theoretical concept, while suggesting extensions and modifications of discipline-agnostic feedback concepts enables the field to advance both practice and research. Tailoring models of feedback literacy to explicitly include consequential feedback would shift both language and attention. For example, in addition to teaching students to 'seek' (evaluative) feedback (Leenknecht and Carless 2023), educators

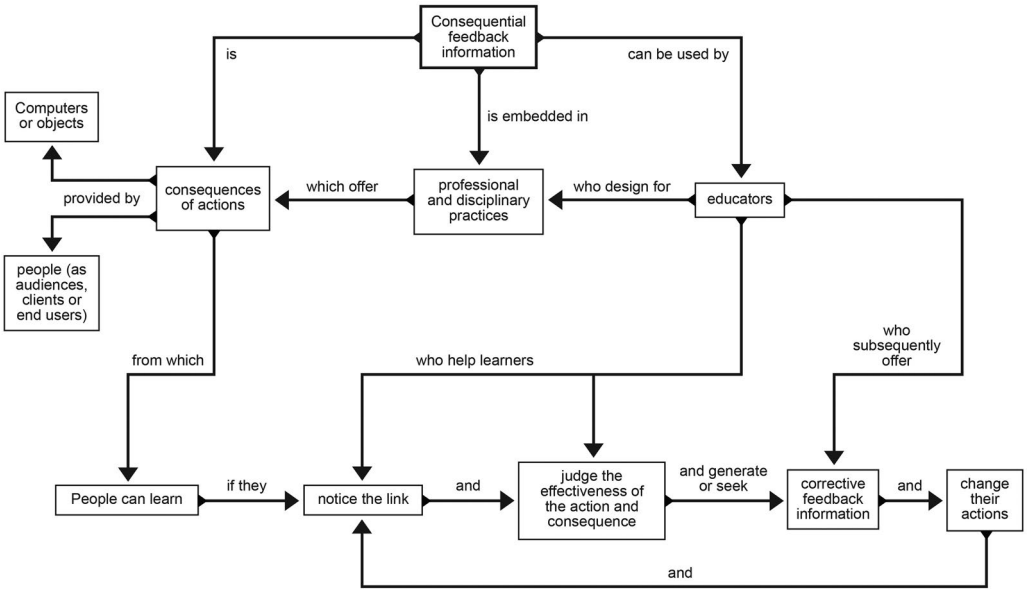

Figure 1. Towards a general theory of consequential feedback.

would help students 'notice' and 'judge' or interpret existing consequential feedback. The socio-material concept of 'attunement' (Fenwick 2016) may become foregrounded as we recognise that most consequential feedback is embedded in complex, socio-material encounters. When designing feedback opportunities, educators would consider both evaluative and consequential feedback. They would consider not only how people (teachers, peers, service users, audiences, students themselves) are the source of feedback information, but how objects, including computer programmes, data displays and constructed artifacts from the discipline such as radiographs (Esterhazy, De Lange, and Møystad 2021) provide vital feedback information to be harnessed for learning. Educators would consider how to use consequential and corrective feedback in tandem (e.g. Paloncy 2020; Williford 1998) or prompt self-generated feedback about consequential feedback information (e.g. Brazhkin and Zimmerman 2019).

Focusing on consequential feedback is particularly important for advancing understanding of a wide range of computer-based simulations (e.g. Paloncy 2020; Brazhkin and Zimmerman 2019) and serious games (e.g. Gresalfi and Barnes 2012). Arguably, computer-based learning is likely to become more prevalent with ongoing technological advancements. Consequential feedback is also vital to creating more effective human role-play simulations that involve professional services users (e.g. Dijk, Duijzer, and Wienold 2020).

Finally, consequential feedback is particularly important in work-integrated learning and the transition to professional practice. Professionals must be able to independently observe (attune to) and learn from consequential feedback embedded in their day-to-day professional lives. They need to be able to analyse key performance indicators to formulate strategies or monitor patients' signs and symptoms and adjust their treatments or observe non-verbal reactions of clients or other audiences during professional interactions and adjust their messaging accordingly. All these examples depend upon noticing, interpreting and adjusting behaviour based on consequential feedback in complex, real-time situations. Thus, highlighting these opportunities and capitalising on them during higher education better prepares students for independent judgments when tutors who offer evaluative or corrective feedback will not be present.

Further research could explore proof-of-concept in other settings, such as role plays in social work or teacher education or Moots in law. Studies could explore student feedback literacy around consequential feedback, such as how students perceive, interpret and learn from

consequential feedback, building on Brazhkin and Zimmerman (2019). Researchers could test different combinations of corrective and consequential feedback for their effectiveness in promoting learning in specific situations (e.g. Paloncy 2020). Other studies could focus on teacher feedback literacy (Boud and Dawson 2023), exploring how teachers conceive of, implement, scaffold and support student learning from consequential feedback. We could seek to understand how best to help teachers learn to use this form of feedback effectively.

We argue that discussions of and research on feedback processes must consider consequential feedback. Highlighting consequential feedback as a vital part of the landscape of feedback information allows us to explicitly focus on how students and educators can optimise its use and effect on learning. In sum, consequential feedback plays an important, but largely implicit or overlooked role in enhancing student learning of higher order skills in settings that reflect professional and disciplinary practices. Our model provides research-informed propositions that can guide future research and development.

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