



Discipline-specific feedback literacies: A framework for curriculum design

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Accepted: 21 September 2020 / Published online: 16 November 2020
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Abstract

Feedback literacy is an important graduate attribute that supports students' future work capacities. This study aimed to develop a framework through which discipline-specific feedback literacies, as a set of socially situated skills, can be developed within core curricula. The framework is developed through a content analysis of National Qualifications Frameworks from six countries and UK Subject Benchmark Statements for multiple disciplines, analysis of indicative subject content for a range of disciplines and consultation with subject-matter experts. Whilst most of the benchmark statements incorporate the development of feedback literacy skills related to 'making judgements', attributes relating to 'appreciating feedback' and 'taking action based on feedback' are less prevalent. Skills related to 'managing the affective challenges of feedback' are most prevalent in documentation for applied disciplines. The resulting empirically guided curriculum design framework showcases how integrating the development of discipline-specific feedback literacies can be enacted through authentic learning activities and assessment tasks. In terms of implications for practice, the framework represents in concrete terms how discipline-specific feedback literacies can be integrated within higher education curricula. The findings also have implications for policy: by positioning discipline-specific feedback literacies as graduate outcomes, we believe they should be integrated within national qualifications frameworks as crucial skills to be developed through higher education courses. Finally, from a theoretical perspective, we advance conceptions of feedback literacy through a sociocultural approach and propose new directions for research that seek to reconceptualise a singular concept of feedback literacy as multiple feedback literacies that unfold in distinctive ways across disciplines.

Keywords Feedback · Feedback literacy · Feedback literacies · Graduate outcomes · Curriculum

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Introduction

A central aim of higher education is to prepare students for life beyond university. To this end, identifying key graduate attributes or outcomes is an important endeavour. For example, the capacity for graduates to work successfully in a team, to think critically and to communicate effectively orally and in writing are often identified as important graduate outcomes necessary for success in the workplace. In recognition of the variability in terminology used to represent graduate attributes or outcomes (Green et al. 2009), for current purposes, we use the term ‘graduate outcomes’ to represent the skills, dispositions and capacities students should develop alongside content knowledge.

An important set of skills for success in the workplace is the capacity to seek, generate and use feedback information effectively, and to engage in feedback processes to support ongoing personal and professional development. These are not just academic skills but life-long learning skills that support development in professional, personal, recreational and educational contexts. Such capacities are represented by the concept of ‘feedback literacy’ (Carless and Boud 2018; Molloy et al. 2019). Despite growing interest in feedback literacy, thus far the concept has been considered mainly as a generic set of skills and capacities. Using a sociocultural lens, the main aim of the present study is to situate feedback literacy within the context of individual disciplines. Sociocultural theories are particularly useful in addressing the disciplinary nature of feedback processes, in that feedback exchanges take place in socially constituted activities embedded in the norms of how knowledge and skills are developed in different disciplines. From a sociocultural perspective, productive feedback processes can be seen as co-constructed between participants in exchanges shaped by established disciplinary tools and conventions (Esterhazy 2018).

Through this approach, we offer two novel contributions to the literature on feedback literacy: (1) we present a critical exploration of the positioning of feedback literacy as a key graduate outcome, and (2) we introduce the concept of *discipline-specific feedback literacies*, presenting an empirically guided curriculum design framework for their development. First, we outline existing research on the concept of feedback literacy, before exploring different models for skill development in higher education courses. We develop our framework for embedding the development of discipline-specific feedback literacies in curriculum design through a content analysis of international documentation and consultation with subject-matter experts, seeking to address the following research issues: (a) the extent to which feedback literacy is recognised as an important graduate outcome in National Qualifications Frameworks (NQFs), and the extent to which this varies across discipline-level guidelines; (b) the opportunities to embed the development of discipline-specific feedback literacies within core curricula. We conclude by discussing the implications of the resulting framework for policy, practice and future research.

Feedback literacy

The concept of feedback literacy was first discussed by Sutton (2012), where he drew upon academic literacy approaches to argue that feedback literacy encompasses ‘the ability to read, interpret and use written feedback’ (Sutton 2012, p. 31). In a significant conceptual framing of feedback literacy, Carless and Boud (2018) propose that feedback literacy involves students developing an appreciation of the value of feedback, and their active role

in its processes (categorised in their framework as ‘appreciating feedback’); the evolving ability to make sound judgements about their own and others’ work (‘making judgements’); capacities in managing the affective challenges of feedback (‘managing affect’); and acting upon feedback information (‘taking action’). ‘Affect’ in the context of feedback literacy represents feelings, emotions and attitudes in response to feedback, and the management of defensive reactions to feedback information (Carless and Boud 2018).

The importance of feedback literacy is underscored by significant recent interest. Conceptually oriented work has focused on identifying characteristics of teacher feedback literacy (Carless and Winstone, 2020), and learning activities to support the development of student feedback literacy (Malecka et al. 2020). Drawing upon a large-scale survey and seven case studies of effective feedback practice, Molloy et al. (2019), developed a learning-centred framework for feedback literacy providing empirical support for many of the components of feedback literacy in Carless and Boud’s (2018) conceptual model. This framework also highlighted the importance of students actively seeking feedback information, recognising their central role in reciprocal feedback processes and preparing themselves for lifelong learning.

Feedback literacy has both short-term and long-term applications. In the short-term, it enables students to make better use of existing feedback opportunities within university curricula and assessment regimes (Molloy et al. 2019). Over the longer-term, it enables students to develop their evaluative judgement (Tai et al. 2018) and engage more effectively in work environments (Noble et al. 2020). Yet, despite growing appreciation of the importance of feedback literacy, thus far the concept has mainly been considered as a generic set of capacities. The current study fills this research gap by extending the current framing of feedback *literacy* to consider the development of discipline-specific feedback *literacies*, through a sociocultural lens. Sociocultural approaches to feedback recognise that students’ capacities to participate in feedback processes are socially-situated and may unfold in distinctive ways in different disciplinary contexts (Esterhazy et al. 2019).

Skills development and discipline-specific feedback literacies

There is strong recognition of the role of higher education in doing more than just teaching content; students also need the opportunity to develop skills that support their working lives (Green et al. 2009). This is underscored by the inclusion of skills and competencies within NQFs, which are in use in over 150 countries worldwide (CEDEFOP 2017). A central aim of NQFs is to connect qualifications to professional requirements (Allais 2017), and such frameworks typically articulate the ‘threshold’ outcomes for attainment at different qualification levels. In some countries, there are also discipline-level guidelines (e.g., these are known as Subject Benchmark Statements (SBSs) in the UK) outlining the key knowledge and skills that graduates of a given discipline should possess. Documents such as NQFs and SBSs provide important guidelines regarding which skills should be developed for a given qualification or programme, but not necessarily how.

There is lively debate within the higher education literature regarding the most beneficial ways to support students’ skill development. One strongly contested model is for students to develop skills in separate sessions or courses, in a ‘bolt-on’ approach. In contrast, in an ‘embedded’ model, skills are developed in conjunction with learning about subject content, as part of disciplinary curricula (Wingate 2006). These differing perspectives align with the distinction between ‘generalists’ and ‘specifists’ who hold different

perceptions of whether the development of key skills can take place outside disciplinary contexts (Green et al. 2009). Challenges inherent to the ‘bolt-on’ approach include low attendance at optional sessions (Harris and Ashton 2011), and that it is typically higher-achieving students that choose to attend (Wingate 2006). Students may also struggle to see the relevance of ‘bolt-on’ sessions to their discipline, because the skills being developed are ‘divorced from subject knowledge’ (Wingate 2006, p. 467). In contrast, the embedded approach adopts ‘a broader view of skills as not only useful for academic study, but also for students’ lifelong personal and professional development’ (Wingate 2006, p. 459), and this approach has been used in many areas of skills development, such as information literacy (Gunn et al. 2011), and academic literacies (Murray and Nallaya 2016; White and Lay 2019).

Pedagogic models for the development of feedback literacy are still in their infancy. Winstone and Nash (2016) designed a toolkit of resources to support students’ engagement with feedback, called the *Developing Engagement with Feedback Toolkit* (DEFT). One component of the DEFT is a set of activities and resources that can be used to create feedback workshops that give students the opportunity to explore the purpose of feedback, manage emotional responses to feedback and consider how to act upon it in meaningful ways. Activities such as those in the DEFT appear to have a positive impact on the development of students’ feedback literacy (Winstone et al. 2019). However, since it can be argued that graduate outcomes ‘sit at the very heart of discipline knowledge and learning’ (Barrie 2004, p. 266), the development of feedback literacy as a core graduate outcome necessitates an appreciation of how feedback may be viewed differently across disciplines. This repositions feedback literacy from being a general capacity to something altogether more complex, involving multiple and plural practices that are socially situated and context-specific (Gravett 2020). This is in line with the literature on academic literacies (Lea and Street 2006), and with sociocultural approaches to feedback (Esterhazy et al. 2019). By combining the development of feedback literacy with core disciplinary content in a fusion of skills and conceptual development (Winstone and Carless 2019), there is potential for students to develop discipline-specific feedback literacies.

Context and research questions

In the present study, we develop an empirically guided curriculum design framework for embedding the development of discipline-specific feedback literacies within higher education curricula. In order to provide an empirical basis for the development of such a framework, we sought to identify how skills pertaining to feedback literacy are currently identified within graduate outcomes, and how the ways in which feedback is operationalised in the discourse of disciplines can inform the design of opportunities to develop discipline-specific feedback literacies. In order to achieve these aims, we drew upon two sources of data: (1) a content analysis of NQFs and SBSs, which provide guidance to universities about graduate or threshold outcomes, and (2) consultation with subject-matter experts. We aimed to address the following research questions:

- 1 To what extent are key components of feedback literacy identified as graduate or threshold outcomes in a sample of NQFs?
- 2 To what extent are there disciplinary differences in the identification of feedback literacy as graduate or threshold outcomes in a sample of SBSs?

- 3 What opportunities exist to develop discipline-specific feedback literacies within the core curriculum in a range of subjects?

To what extent are key components of feedback literacy identified as graduate or threshold outcomes in a sample of NQFs?

NQF sampling

In order to address research question 1, we analysed a sample of six NQFs that covered graduate or threshold outcomes in a comprehensive amount of detail. Saunders and Blanco Ramírez (2017) sampled policy documents on university teaching across national contexts by selecting documents from countries covering both the Global North and Global South in order to seek ‘the widest possible geographic diversity’ (p. 403). Likewise, our aim was to explore a small number of diverse contexts in detail, rather than seeking to represent NQFs across all nations, so we adopted a comparable broad sampling approach. Firstly, we anticipated that countries with high quality higher education systems may be most likely to have recognised NQFs, so we used the QS World University Rankings list (2020) to determine which countries had a university in the top 10 for each region of the world (QS classifies universities according to the following regions: Asia, Africa, Europe, Latin America, North America and Oceania). We then read a range of available NQFs from countries with a top university in each of these regions, and selected the documents that described graduate outcomes in the greatest amount of detail for analysis. Table 1 gives an overview of the NQFs included in the study.

Content analysis of NQFs

A coding scheme was developed deductively, using Carless and Boud’s (2018) feedback literacy framework (see Table 2), then all of the sampled NQFs were entered into NVivo to enable a content analysis of evidence of concepts pertaining to feedback literacy in graduate or threshold outcomes (where NQFs included multiple qualifications, we only focused on the outcomes of bachelor’s degrees or bachelor’s degrees with honours). The first author read all sampled NQFs, then coded whether any graduate outcomes reflected Carless and Boud’s (2018) four feedback literacy dimensions: appreciating feedback, making judgements, managing affect and taking action. The second author then independently read all of the NQFs and also coded for evidence of feedback literacy. An interrater reliability analysis indicated there was high enough agreement between the two coders to retain the first author’s codes (Krippendorff’s $\alpha = 0.75$; alpha values of 0.70 and above are acceptable when using conservative indices in exploratory research (Lombard et al. 2002), which is the case here).

NQF findings

The most common element of feedback literacy evident in the sample of NQFs was ‘making judgements’; five of the six NQFs included this as an important outcome of higher education programmes. For example, the Mexican NQF made reference to the importance of students ‘assuming certain responsibilities with regard to the evaluation

Table 1 Overview of NQFs sampled

Region	Name of NQF	Country
Asia	Generic Level Descriptors of the Hong Kong Qualifications Framework (Hong Kong Education Bureau, 2018)	Hong Kong
Africa	Level Descriptors for the South African National Qualifications Framework (South African Qualifications Authority, 2012)	South Africa
Europe	The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (Quality Assurance Agency, 2014)	UK
Latin America	Mexican Qualifications and Assignment System Framework ^a (Secretaría de Educación Pública, 2014)	Mexico
North America	The Degree Qualifications Profile (Adelman et al., 2014) ^b	USA
Oceania	Australian Qualifications Framework (Australian Qualifications Framework Council, 2013)	Australia

^aThis framework was translated from Spanish to English by a fluent speaker of both languages

^bThis was the only framework published by a private body (Lumina Foundation)

Table 2 Coding scheme (based on Carless and Boud (2018, p. 1319)

Component	Feedback literate students:	Example codes
Appreciating feedback	Understand and appreciate the role of feedback in improving work and the active learner role in these processes Recognise that feedback information comes in different forms and from different sources	Strengths/weaknesses Professional development Function of feedback
Making judgements	Use technology to access, store and revisit feedback Develop capacities to make sound academic judgements about their own work and the work of others Participate productively in peer feedback processes	Self-assessment Reflection Peer feedback
Managing affect	Refine self-evaluative capacities over time in order to make more robust judgements Maintain emotional equilibrium and avoid defensiveness when receiving critical feedback Are proactive in eliciting suggestions from peers or teachers and continuing dialogue with them as needed Develop habits of striving for continuous improvement on the basis of internal and external feedback	Constructive criticism Striving for improvement Learning through mentoring/supervision
Taking action	Are aware of the imperative to take action in response to feedback information Draw inferences from a range of feedback experiences for the purpose of continuous improvement Develop a repertoire of strategies for acting on feedback	Use feedback Act on feedback

and improvement of work or study activities’, and the South African NQF included as an important outcome ‘the ability to apply, in a self-critical manner, learning strategies which effectively address his or her professional and ongoing learning needs’. The other dimensions of Carless and Boud’s (2018) framework were far less prevalent. We found no examples of the ‘appreciating feedback’ or ‘taking action’ components in graduate outcomes, and only one instance of ‘managing affect’, in terms of using internal and external feedback through mentoring for continuous improvement: ‘Work under the mentoring of senior qualified practitioners’ (Hong Kong NQF).

To what extent are there disciplinary differences in the identification of feedback literacy as graduate or threshold outcomes in a sample of SBSs?

SBS sampling

To address research question 2, we first categorised all of the academic disciplines that had a UK-based SBS published as part of a quality code for higher education in the UK (Quality Assurance Agency n.d.) into categories using the Becher-Biglan typology of hard-pure, hard-applied, soft-pure and soft-applied (Becher 1989; Becher and Trowler 2001; Neumann et al. 2002). Although Trowler (2014) cautioned that grouping disciplines can be essentialist and reductionist because it ignores the heterogeneity that exists both within and between disciplines, he also argued that a moderate amount of essentialism is acceptable for heuristic purposes. We only focused on UK-based SBSs because discipline-specific frameworks on graduate or threshold outcomes do not appear to exist with the same level of detail for other countries (guidance tends to be generically focused on the qualification level). We then obtained six SBSs from within each category in this typology (24 SBSs in total) to ensure we sampled a representative range of subjects from across higher education. Table 3 displays all of the SBS disciplines sampled.

Table 3 Overview of disciplines categorised according to the Becher-Biglan typology, with the publication year of SBSs (Quality Assurance Agency, n.d.), sampled

	Pure	Applied
Hard	Biomedical Sciences (2019)	Earth Sciences, Environmental Sciences, and Environmental Studies (2019)
	Biosciences (2019)	
	Chemistry (2019)	
	Materials (2017)	
	Mathematics, Statistics, and Operational Research (2019)	
	Physics, Astronomy, and Astrophysics (2019)	
Soft	Computing (2019)	Art and Design (2017)
	Dentistry (2002)	
	Medicine (2002)	
	Veterinary Science (2019)	
	Engineering (2019)	
	Law (2019)	
Soft	Languages, Cultures, and Societies (2019)	Business and Management (2019)
	Sociology (2019)	
	Psychology (2019)	
	History (2019)	
	Geography (2019)	
	English (2019)	
	Architecture (2010)	Social Work (2019)
	Paramedics (2019)	

Content analysis of SBSs

All sampled SBSs were entered into NVivo, and a content analysis of evidence of concepts pertaining to feedback literacy in graduate or threshold outcomes was performed using the same coding scheme used to code the NQFs (Table 2). Again, the first author read all sampled SBSs, then the second author independently read half of the SBSs and also coded for evidence of feedback literacy. An interrater reliability analysis indicated there was high enough agreement between the two coders to retain the first author's codes (Krippendorff's $\alpha = 0.86$).

SBS findings

In general, components of feedback literacy were most commonly identified as graduate outcomes in applied subjects. There was very little difference in the number of components identified between hard and soft subjects. Table 4 displays the presence of feedback literacy concepts identified in SBSs split by discipline category and component from Carless and Boud's (2018) framework. Examples of these components of feedback literacy are discussed further below.

Appreciating feedback

The capacity to appreciate that feedback plays an important role in improving work was only identified as a graduate outcome in one discipline: 'appreciate the benefit of giving and receiving feedback' (SBS, English, Soft Pure).

Making judgements

As with the NQFs, this dimension of feedback literacy was the most commonly identified component in the graduate outcomes of the SBSs, and there was a fairly even spread across all discipline categories. In some cases, this represented the importance of developing a general sense of what 'good' looks like, leading to students having the capacity to show 'understanding of quality standards' (SBS, Art and Design, Soft Applied). There was also some recognition that it is valuable for students to be able to 'evaluate their own performance as an individual and a team member' (SBS, Biomedical sciences, Biosciences, Hard Pure). For some subjects this may be more nuanced than others; in the hard sciences, binary judgements of right/wrong may be required (e.g. 'Mistakes can be identified'; SBS, Materials, Hard Pure) or in relation to a product this may require the 'ability to exercise critical judgement' (SBS, Computing, Hard Applied).

An important aspect of making judgements as outlined by Carless and Boud (2018) is the capacity to engage in peer feedback activities. In some disciplines, this was explicitly framed as peer review; in others, the evaluation of others' work was referred to in conjunction with self-evaluation:

Use the principles of peer review and quality assurance in dental practice (SBS, Dentistry, Hard Applied).

Table 4 Components of feedback literacy identified in the graduate outcomes of SBSs across disciplines

		Appreciating feedback	Making judgements	Managing affect	Taking action
Hard Pure	Biomedical Sciences		•	•	
	Biosciences		•	•	
	Chemistry				
	Materials		•		
	Mathematics/Statistics/Operational Research		•		
	Physics, Astronomy, and Astrophysics				
Total		0	4	2	0
Hard Applied	Earth/Environmental Studies/Sciences		•	•	
	Computing		•		
	Dentistry		•	•	
	Medicine		•		
	Veterinary Science		•	•	
	Engineering		•	•	
Total		0	6	4	0
Soft Pure	Languages, Cultures, and Societies		•		
	Sociology		•		•
	Psychology		•		
	History				
	Geography		•		
	English	•	•		
Total		1	5	0	1
Soft Applied	Law			•	•
	Business and Management		•	•	
	Architecture		•		
	Paramedics		•		
	Social Work		•	•	
	Art and Design		•	•	
Total		0	5	4	1

Use reflection to appraise, evaluate and enhance professional practice in self and colleagues (SBS, Paramedics, Soft Applied).

Carless and Boud (2018) also identify the capacity to develop and refine self-evaluative capacities within their framework of feedback literacy, and one of the most common forms of judgement cited in the documents was the student's capacity to evaluate not their work, but their own strengths and weakness. In many disciplines, this was viewed as an important dimension of reflective practice, for example:

Self-awareness and reflection—evaluating their performance and personal capability,

and recognising the limits of their competence (SBS, Medicine, Hard Applied).
 Self-reflection, self-analysis (SBS, Business and Management, Soft Applied).
 Evaluate personal strengths and weaknesses (SBS, Geography, Soft Pure).
 To be aware of own strengths and to understand when help is needed (SBS, Mathematics, Statistics, and Operational Research, Hard Pure).

Managing affect

This dimension of feedback literacy was the second most commonly identified component and was much more prevalent in applied subjects. There was very little difference in its presence between hard and soft domains. The capacity to avoid defensive reactions to feedback was evident in two disciplines. In Law, it was recognised that graduates need to demonstrate ‘a willingness to acknowledge and correct errors’ (SBS, Law, Soft Applied), whereas Dentistry graduates need to show the capacity to ‘receive constructive criticism’ (SBS, Dentistry, Hard Applied). The SBS for Veterinary Science also made reference to the importance of graduates eliciting feedback, through a willingness to ‘take part in self-audit and peer group review processes in order to improve performance’ (SBS, Veterinary Science, Hard Applied). The most common evidence of feedback literacy in terms of managing affect related to the capacity for students to strive for continuous improvement on the basis of feedback, for example:

Benefit from the critical judgements of others (SBS, Art and Design, Soft Applied).
 Use supervision as a tool to aid professional development (SBS, Social Work, Soft Applied).

Taking action

The importance of developing the capacity to take action on feedback was rarely recognised in the SBSs. Two references to taking action were identified, both in soft disciplines. In Law, it was recognised that graduates need to be able to ‘make effective use of feedback’ (SBS, Law, Soft Applied), whereas in Sociology, graduates are required to demonstrate they have the capacity ‘to take action to improve and enhance their capacities’ (SBS, Sociology, Soft Pure).

What opportunities exist to develop discipline-specific feedback literacies within the core curriculum in a range of subjects?

With the exception of ‘making judgements’ across most subjects and ‘managing affect’ in applied domains, the dimensions of feedback literacy were not frequently identified as key graduate outcomes. Therefore, we now draw upon two sources of data to inform the development of a framework for how all dimensions of feedback literacy can be integrated within disciplinary curricula, as opposed to using a ‘bolt-on’ approach. First, we returned to our sample of SBSs, this time focusing our attention on indicative subject content, and second, we consulted subject-matter experts in order to identify opportunities for developing discipline-specific feedback literacies.

Expert consultation

We sent to a group of UK National Teaching Fellows an open-ended survey comprising two questions: ‘Taking feedback out of its educational context, does the concept of feedback hold any particular meaning or relevance that is specific to your discipline?’ and ‘Can you think of any ways in which you could explain to students the importance of acting upon feedback, using concepts specific to their discipline of study?’ This group was sampled because they had been recognised for their expertise in teaching and learning in different disciplines. Eighteen of these experts replied, five from Soft Pure disciplines, five from Soft Applied disciplines, three from Hard Pure disciplines, and five from Hard Applied disciplines.

Towards a curriculum design framework for developing discipline-specific feedback literacies

There were two stages to our analysis. First, we identified elements of subject content that may have relevance to learning about feedback. Second, we coded these inductively, combining our codes to develop five themes: responding to task briefs and client requirements; reflection on and evaluation of professional practice; promoting behaviour change; the mechanisms of learning and supporting others to learn and develop; and learning about cognate concepts. We now discuss each of these themes in turn.

Responding to task briefs and client requirements

In many disciplines, students learn how to respond to a task brief provided by a client, and amend their designs or products in light of feedback from clients. This may include the requirement to ‘prepare designs that will meet building users’ requirements’ (SBS, Architecture, Soft Applied), to ‘understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics’ (SBS, Engineering, Hard Applied), or to ‘analyse the extent to which a computer-based system meets the criteria defined for its current use and future development’ (SBS, Computing, Hard Applied). These discipline-specific capacities could be used to develop students’ feedback literacies by opening up discussion around responses to criticism and the challenges of having to return to and refine work when one has invested time in it. There may also be opportunities to develop students’ capacities to self-evaluate their own academic work-in-progress by discussing the similarities between responding to a design brief and responding to an assessment brief, for example continuous evaluation of whether the criteria are being addressed. Some disciplinary activities may also facilitate discussion about the importance of ongoing dialogue in feedback processes:

Some areas of art and design are reliant upon evolving dialogue and negotiation between the practitioner (working individually or within teams as proactive collaborator/mediator) and the client, manufacturer, audience, user, customer, participant or recipient. (SBS, Art & Design, Soft Applied).

Reflection on and evaluation of professional practice

Many disciplines aim to inculcate within students an approach to reflective practice, where the use of feedback forms a cornerstone of developing as a practitioner throughout one's career. This is particularly the case in professions allied to health:

[students should understand] the processes of reflection and reflexivity as well as approaches for evaluating service and welfare outcomes for vulnerable people, and their significance for the development of practice and the practitioner. (SBS, Social work, Soft Applied).

All students understand that whilst on placement they will be getting feedback all the time often in challenging and upsetting situations. It is our role to prepare them for this and how to act upon it professionally and appropriately before, during and after placement as part of professional socialization. (Expert response, Physiotherapy, Soft Applied).

Our expert respondent in Nursing also identified that when discussing important events in the discipline, students could develop an understanding of the importance of seeking and acting upon feedback:

There are plenty of examples of poor practice [in clinical negligence cases] when if colleagues had offered feedback to each other early on some of the poor practice could have been averted and stopped a culture of unacceptable care. (Expert Response, Nursing, Soft Applied).

As well as evaluating their own practice and development, many disciplines also develop the capacity within students to evaluate products and processes, making judgements about quality. This may involve 'the ability to evaluate systems in terms of quality attributes and possible trade-offs presented within the given problem' (SBS, Computing, Hard Applied). These discipline-specific activities may provide opportunities for students to learn about the importance of making judgements about the quality of their academic work, and might also be used to explain why peer feedback is of benefit in terms of developing these outcomes.

Promoting behaviour change

Many disciplines include the requirement for students to learn about the process of providing guidance and feedback to individuals, organisations or broader society with the overall aim of modifying behaviour and associated outcomes. This is perhaps most prevalent within disciplines allied to health and medicine, where learning about health promotion and health education was evident in the SBSs of Dentistry, Medicine and Paramedics. The parallel between students learning to give feedback to patients in managing their conditions, and their own learning about using feedback to improve their work, was articulated in detail by our Expert in Health Sciences:

Practitioners give feedback to patients to help achieve the 'desired' result and re-educate the patient's understanding of the physiology. Feedback can be physical (verbal/visual) and psychosocial and linked to 'personal goals'. It is a two-way process and really cyclical as patient and practitioner need to keep telling each other what is felt, seen etc. (Expert response, Health Sciences, Soft Applied).

This alignment was reflected in many of the SBSs:

Recognise their role in and responsibility for improving the general and oral health of the community through treatment strategy, education and service (SBS, Dentistry, Hard Applied).

The graduate will be able to give advice on health promotion and disease prevention (SBS, Medicine, Hard Applied).

Knowledge and understanding of the role paramedics contribute to, in relation to the public health and health promotion of service users (SBS, Paramedics, Soft Applied).

Even beyond health professions, the analysis of the SBSs revealed that graduates of other disciplines also learn about how their subject-specific knowledge can make a contribution ‘to policy and practice, influencing behaviour and delivering positive change to environmental performance’ (SBS, Earth/Environmental Studies/Sciences, Hard Applied), and can inform ‘ways of mitigating human and physical problems and of addressing new challenges’ (SBS, Geography, Soft Pure). Given the long-term inertia in terms of action in response to expert feedback regarding the effects of climate change, this could be used to facilitate discussion about the barriers to responding to feedback. There are also landmark cases in disciplines such as Social Work where feedback was not acted upon, leading to serious consequences. These cases could be used to emphasise the importance of responding to feedback, aligned with the recognition that an important topic within the curriculum is to ‘develop effective helping relationships and partnerships that facilitate change for individuals, groups and organisations while maintaining appropriate personal and professional boundaries’ (SBS, Social Work, Soft Applied).

The mechanisms of learning and supporting others to learn and develop

In many disciplines, students learn about the very process of learning, which may provide an opportune curriculum space through which to develop students’ feedback literacies in parallel with their disciplinary understanding. The discipline of Psychology is an obvious example, where students study the neuroscience of learning, the cognitive processes underpinning learning, the social processes related to evaluation and identity, and individual differences in cognitive processes. This high degree of relevance was identified by one expert respondent:

Feedback is a key element of all types of learning in psychology, e.g. biofeedback can be used to manage stress. (Expert Response, Psychology, Soft Pure).

Beyond the obvious affiliation with Psychology, other disciplines also evidenced the need for students to learn about educating others, which would be an opportunity to discuss the role of feedback in these processes. For example, disciplinary curricula include ‘environmental education and training (such as carbon literacy, education for sustainability, development)’ (SBS, Earth/Environmental Studies/Sciences, Hard Applied), and coverage of the ‘educational principles through which learning takes place’ (SBS, Medicine, Hard Applied). Furthermore, in some disciplines, students specifically cover theories of learning because ‘the theories underpin continuing professional development, enabling individuals to be active lifelong learners. This knowledge also equips the paramedic to become an effective teacher in a wide range of settings’ (SBS, Paramedics, Soft Applied).

The importance of supporting others to learn and develop forms an important part of the curriculum in many disciplines, and could be an ideal space in which to discuss feedback

with students. In Business and Management, learning about ‘leadership, management, and development of people and organisations’ (SBS, Business and Management, Soft Applied) has many links to feedback. Similarly, in Social Work it is identified that students need to learn about ‘the contribution of different approaches to management and leadership within different settings, and the impact on professional practice and on quality of care management and leadership in public and human services’ (SBS, Social Work, Soft Applied).

Learning about cognate concepts

Whilst the concept of feedback is well-established in educational discourse, its roots are in the physical sciences (Wiener, 1968). With this in mind, it is perhaps not surprising that our expert respondents identified opportunities to align the development of students’ understanding of feedback with their learning of these cognate concepts, and that many such examples were evident in the benchmark statements:

In health the term feedback is used related to body signals linked to movement [feedback loops in biomechanics] or sensation which is then processed to continue or change an action. (Expert response, Health Sciences, Soft Applied).

Feedback in physics means that the output from a system at one time is fed back into the system at a later time to affect the later output (Expert Response, Physics, Hard Pure).

Respondents identified ‘feedback loops in homeostasis in biochemistry/physiology’ (Expert response, Biology, Hard Pure) as a cognate concept, reflecting the relevant SBS:

Internal and external regulation: homeostasis (autoregulation and extrinsic regulation), the function of homeostatic regulation, role of negative feedback in maintenance of homeostasis and components of feedback systems (loops) (SBS, Biomedical Sciences, Hard Pure).

The responses from our experts demonstrate that, with a little thought, some interesting parallels can be drawn between cognate disciplinary concepts and the concept of feedback in ways that could support the development of students’ discipline-specific feedback literacies. For example, this quotation illustrates how the beneficial outcomes of feedback cycles could be explained with reference to chemical reactions:

Assessment can be compared to a chemical reaction: We start off with an assignment brief (the reactants) and end up with comments from the tutor/peers (the products). Specifically, assessments are most usefully conceived as an exothermic gas evolution reaction. If this process is left unattended, comments from tutors/peers being ignored, then undesirable consequences will result! (Expert response, Chemistry, Hard Pure).

Here, there is a relevant explanation for the undesirable outcomes than can occur when no action is taken upon feedback. This final example serves as an excellent illustration of how the principles of discipline-specific feedback literacies can be explored in conjunction with subject content, without the need for additional sessions or courses. Table 5 synthesises this analysis and presents our curriculum design framework for integrating the development of discipline-specific feedback literacies through authentic activities and assessment tasks.

Table 5 Summary of curriculum-design framework for developing discipline-specific feedback literacies

Theme	Discipline-specific feedback literacies may be enhanced through:	Dimensions of feedback literacy developed	Disciplines where approach may be particularly effective
Responding to task briefs and client requirements	<p>Explaining how feedback is important for understanding client needs</p> <p>Drawing links between responding to criteria in an assessment brief and responding to a client's task brief and/or other requirements</p> <p>Drawing links between managing assessment feedback critiques to improve academic performance and managing client criticism in order to refine work</p> <p>Enabling students to use assessment feedback in similar ways to client feedback</p>	<p>Appreciating feedback</p> <p>Making judgements</p> <p>Managing affect</p> <p>Taking action</p>	<p>Soft Applied</p> <p>Hard Applied</p>
Reflection on and evaluation of professional practice	<p>Discussing real events in the discipline where failure to seek feedback led to poor practice</p> <p>Drawing links between evaluating the quality of products or processes in students' discipline and evaluating the quality of their academic work</p> <p>Preparing students for regular appraisal and evaluation that is part of professional practice</p> <p>Instilling an approach to reflective practice where the use of feedback forms a cornerstone of developing as a practitioner</p>	<p>Appreciating feedback</p> <p>Making judgements</p> <p>Managing affect</p> <p>Taking action</p>	<p>Soft Applied</p> <p>Hard Applied</p> <p>Soft Pure</p>
Promoting behaviour change	<p>Highlighting the parallel between learning to give feedback to others to change their behaviour, and their own learning about using feedback to improve their work</p> <p>Debating how a lack of response to feedback within the field reflects barriers to using feedback</p> <p>Supporting students to use internal feedback to change their own behaviour</p>	<p>Appreciating feedback</p> <p>Making judgements</p> <p>Taking action</p>	<p>Soft Applied</p> <p>Hard Applied</p> <p>Soft Pure</p>

Table 5 (continued)

Theme	Discipline-specific feedback literacies may be enhanced through:	Dimensions of feedback literacy developed	Disciplines where approach may be particularly effective
The mechanisms of learning and supporting others to learn and develop	Discussing the role of feedback in the processes that underpin learning of that discipline	Appreciating feedback	Soft Applied Hard Applied Soft Pure
	Discussing the role of peer feedback in mentoring and educating others	Making judgements	
	Highlighting how both students and teachers use feedback for their own and others' ongoing professional development and lifelong learning	Taking action	
Learning about cognate concepts	Contrasting the concept of feedback within the discipline to the concept of feedback for learning	Appreciating feedback	Soft Applied Hard Applied Hard Pure
	Showing how assessment feedback should be used to actively improve academic work	Taking action	

Discussion

In this paper, we have argued for the importance of feedback literacy as an important graduate outcome, and have inductively developed a framework for an embedded rather than ‘bolt-on’ approach to the development of students’ discipline-specific feedback literacies in higher education courses (Table 5).

We started at the international level, and conducted a content analysis of six NQFs to analyse the extent to which the components of feedback literacy are identified as graduate outcomes. Our analysis identified that whilst the capacity to make judgements was included in five of the six NQFs we sampled, the other dimensions of feedback literacy were minimally evident. This finding was mirrored in our second analysis, where we moved to the national level to explore across a range of disciplines whether the components of feedback literacy were evident in SBSs. Once again, the capacity to make judgements was the most commonly-identified element of feedback literacy within statements of graduate outcomes, which supports recent claims for the importance of these skills in supporting lifelong learning (e.g. Ibarra-Sáiz et al. 2020). Taken together, these findings suggest that developing capacities for making sound judgements is a particularly important graduate attribute and that other critical dimensions of feedback literacy (i.e. appreciating the purpose of feedback and taking action on feedback) are barely present as important outcomes of higher education, despite the essential nature of these skills for employment and lifelong learning. Furthermore, components of feedback literacy appear to be more prominent in SBSs for applied disciplines in comparison to pure domains.

That we found minimal evidence (with the exception of ‘making judgements’) of the identification of feedback literacy within statements of graduate outcomes indicates that critical discussion is needed over the importance of these skills for interpersonal and professional functioning. Perhaps one reason for minimal presence of feedback literacy in these frameworks is that it is sometimes taken for granted that students know how to make effective use of feedback, but this is seldom the case (Winstone et al. 2017). Given the importance of feedback literacy for success at university and in the future workplace, it should be identified in NQFs and SBSs, both in terms of generic graduate outcomes and in disciplinary curricula.

Our analysis of NQFs and SBSs also highlights a need for integrating discipline-specific feedback literacies into all curricula, but especially pure disciplinary curricula, and finding ways for encouraging students to appreciate feedback in all its forms whilst taking action in order to realise the impact of feedback on learning. Thus, having identified mixed evidence of the identification of feedback literacy in graduate outcomes, we then scrutinised disciplinary content and consulted disciplinary experts in order to understand where the development of discipline-specific feedback literacies could be integrated within curricula. The curriculum design framework offers implications for practice in providing a more comprehensive and sustainable approach to the development of students’ feedback literacies than ‘bolt-on’ approaches such as centrally-run workshops. Within the framework, we have identified ways of integrating the components of ‘appreciating feedback’ and ‘taking action’, which were not present in our analysis of NQFs and barely identified as outcomes in SBSs. It is also important to highlight that all of the themes identified in our framework support ‘taking action’ which is a crucial aim of effective feedback processes (Winstone and Carless 2019).

Our curriculum design framework is potentially applicable to a wide variety of international higher education contexts. The framework guides educators in opening up

conversations about feedback within the sociocultural contexts of disciplinary learning and indicates where within curricula links can be drawn between concepts and skills being developed within the context of the discipline itself, and students' understanding of feedback. For example, in disciplines where behaviour change forms an important part of the curriculum, this provides a space within which to engage students in discussion about the importance of acting upon feedback (e.g. comparing the lack of change in health outcomes of a patient who is not receptive to feedback on their eating behaviour from a dietitian, with the limited opportunities for performance improvement where assessment feedback is not acted upon).

The framework can also inform the design of authentic assessment tasks characterised by realism, cognitive challenge and evaluative judgement (Villarroel et al. 2018) as a means of supporting the development of students' discipline-specific feedback literacies. For example, in applied disciplines where responding to task briefs and client requirements is an important part of students' learning, following a design task, students could respond to feedback from teachers in the manner in which they would respond to feedback from clients. This might include setting out how they interpret the feedback and where they would go back to the client to seek further clarification. This response to feedback would reflect the way in which feedback is used in the discipline bringing authenticity to students' learning, as well as assessment and feedback processes. Esterhazy (2018) argues that disciplinary practices include discipline-specific educational practices (e.g. approaches to learning and teaching), as well as discipline-specific professional practices (e.g. work-related practices in a discipline). Whilst our approach has focused on the latter, it is important to recognise that there are important discipline-specific educational practices, where the form of feedback itself may vary according to discipline with different emphases on oral, written, visual, physical or digitally-based modes of feedback. The framework also supports the use of 'authentic' feedback practices that align with common ways in which feedback is typically given in professional contexts associated with different disciplines (see Dawson et al. 2020).

Conclusion

In the current research, we have presented a curriculum design framework for developing discipline-specific feedback literacies that seeks to transform the operationalisation of this concept. From a theoretical perspective, we have advanced conceptions of feedback literacy through a sociocultural lens in order to argue for the importance of discipline-specific feedback literacies, where the development of these important capacities takes place within distinctive social, cultural and disciplinary contexts. This opens up new directions for research that seek to understand how feedback literacies develop through socially situated interactions. Our findings also have implications for policy: by positioning discipline-specific feedback literacies as graduate outcomes, we believe they should be integrated within documentation such as NQFs and SBSs as important skills to be developed alongside the usual skills students are expected to develop during higher education, such as critical thinking and information literacy skills. The framework we have presented provides the means for educators to integrate discipline-specific feedback literacies within curricula, in a fusion of skills and conceptual development.

Acknowledgements The authors thank María Norman for support in document translation.

Funding This research was supported by Advance HE through the award of a National Teaching Fellowship to the first author.

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