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## Can students' feedback literacy be improved? A scoping review of interventions

Tegan Little<sup>a</sup> , Phillip Dawson<sup>a</sup> , David Boud<sup>a,b,c</sup>  and Joanna Tai<sup>a</sup> 

<sup>a</sup>Centre for Research in Assessment and Digital Learning, Deakin University, Melbourne, Victoria, Australia;

<sup>b</sup>Faculty of Arts and Social Sciences, University of Technology, Sydney, New South Wales, Australia; <sup>c</sup>Work and Learning Research Centre, Middlesex University, London, UK

### ABSTRACT

Student feedback literacy has been the subject of much conceptual literature; however, relatively little intervention research has investigated how and if it can be developed. Further, no evaluation of the current empirical literature has been conducted to assess which elements of feedback literacy can be successfully improved in practice, and which elements need further investigation. This paper seeks to explore how different aspects of feedback literacy have been developed in higher education. A scoping review was conducted to address the foci, nature and success of interventions. The review found evidence that educational interventions enhanced feedback literacy in students, such as managing perceptions and attitudes, and having more confidence and agency in the feedback process. While some interventions have an effect on influencing student feedback literacy, both improved study design and intervention design are required to make the most of future feedback literacy interventions.

### KEYWORDS

Feedback literacy; feedback; scoping review; empirical research

Feedback has been recognised as a powerful learning tool in higher education (Hattie and Timperley 2007). If students are to make use of this power, they must learn to appropriately engage with feedback and have the capacity to do so. Thus, research has focused on what students do in the feedback process, including their feedback literacy. Feedback literacy can be defined as 'the understandings, capacities and dispositions needed to make sense of information and use it to enhance work or learning strategies' (Carless and Boud 2018, 1316). As feedback literacy has been viewed as a way to improve student learning in the feedback process (Nieminen and Carless 2022), studies have begun to look at how feedback literacy can be developed using interventions (Hoo, Deneen, and Boud 2022; Tai et al. 2022). These empirical studies range from introducing peer feedback to enhance feedback literacy (Tripodi, Vaughan, and Wospil 2021) to using feedback literacy to increase workplace readiness (Noble et al. 2019). While the conceptual body of work on the benefits of feedback literacy is significant, less is known about how to increase feedback literacy. It is unclear which elements of feedback literacy have been able to be addressed, and what improvements have occurred. This paper seeks to explore key aspects of the development and implementation of feedback literacy interventions that may inform decisions for future empirical research.

**CONTACT** Tegan Little  [tlm@deakin.edu.au](mailto:tlm@deakin.edu.au)

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## ***Conceptions of feedback and feedback literacies***

The concept of feedback has undergone a perspective shift in the past decade of research (Winstone et al. 2021). Current views contend that the notion of feedback should move from an information transmission model towards a student-centred approach (Boud and Molloy 2013). This perspective entails focussing on feedback as a process in which students are active agents. Such a student-centred perspective does not place the full onus on the learner; it is still just as important for educators and institutions to afford beneficial feedback opportunities in course and curriculum design (Malecka, Boud, and Carless 2022). A plethora of research has explored how to establish feedback as a process rather than as information-giving, with mixed success. This includes investigating drivers of student engagement like ‘proactive recipience’ (Winstone et al. 2017), or purposefully embedding feedback tasks at opportune times in the curriculum (Malecka, Boud, and Carless 2022). However, more recently the development of feedback literacy has been explored as a means to increase student engagement and uptake in the feedback process (Winstone, Mathlin, and Nash 2019). By becoming more feedback ‘literate’, it is argued that students can understand, process and use feedback to enhance their learning more effectively (Carless and Boud 2018).

The term ‘feedback literacy’ was first coined by Sutton (2012). He positioned feedback literacy on three different dimensions, referred to as epistemological (knowing), ontological (being) and practical (doing). Later, Carless and Boud (2018) created a framework which positioned the learner as an active participant in the feedback process, as ‘students with well-developed feedback literacy appreciate their own active role in feedback processes; are continuously developing capacities in making sound judgements about academic work; and manage affect in positive ways’ (1318). Subsequently, Molloy, Boud, and Henderson (2020) analysed data of student feedback activities to further elaborate what feedback literate learners attend to in the feedback process. This framework introduces seven key facets of feedback literacy (derived from 31 categories) summarised as: commits to feedback as improvement, appreciates feedback as an active process, elicits information to improve learning, processes feedback information, acknowledges and works with emotions, acknowledges feedback as a reciprocal process, and enacts outcomes of processing of feedback information. This framework not only indicates qualities that a feedback literate learner should possess, but also can be used to guide researchers in what behaviours to observe to understand student levels of feedback literacy.

Further work on conceptualisations of feedback literacy focused on the contextual and cultural factors that impact it, such as Chong’s (2021) ecological model. He contends that engagement with feedback is influenced by objects such as written work, materials, language, and relationships with teachers and peers. This view is supported by Gravett (2022) in her discussion of feedback literacies and sociomateriality, in which culture, artefacts and personal experiences play an important role. Whilst this conceptual understanding of feedback literacy may be sound, it does not in and of itself demonstrate that feedback literacy can be developed in students.

## ***Can student feedback literacy be developed?***

These conceptions of feedback literacy posit that this capability is dynamic and can be developed over time (Malecka, Carless & Boud, 2020). Feedback literacy can be influenced by prior experiences with feedback (whether they be positive or negative), or the sort of affordances and exposure to types of feedback that students have (Malecka, Boud, and Carless 2022). From the conceptual literature, approaches have been proposed to assist with the development of feedback literacy, such as the use of peer feedback, exemplars and adaptation of the learning environment (i.e. teaching instruction, access to resources and feedback conversations) (Carless and Boud 2018). Empirical studies involving feedback interventions have focussed on manipulating these different facets. For example, Winstone, Mathlin, and Nash (2019) developed a ‘toolkit’ to increase worthwhile feedback behaviours, which included a glossary or guide, workshop activities, and surveys.

They found that students rated this intervention as useful for their feedback and learning, and found a quantitative increase in feedback literacy after a workshop. Noble et al. (2019) found similar results in workplace learning. Their intervention (for students on healthcare placement) consisted of an e-learning module, feedback workshop and reflective activities. It resulted in improved engagement, as students exhibited an understanding and appreciation of feedback processes, and enhanced willingness to participate in feedback activities.

Whilst studies reported a quantitative increase in feedback literacy using self-report questionnaires (Tripodi, Vaughan, and Wospil 2021), supporting the notion that it can be developed, several questions remain. Firstly, it is unclear as to which specific elements of feedback literacy have been addressed, and to what extent they have been developed. This leads to the question of whether certain facets of feedback literacy have been over or under studied. Additionally, conceptual work on feedback literacy has rapidly developed in the past few years, as Nieminen and Carless (2022) have noted in their critical review of the topic. However, it is unknown whether empirical research has echoed these findings. To complement the conceptual literature, there is a need to bring together empirical work on improving feedback literacy to understand what has been done, and what is still left to do.

### **Research questions**

The area of fostering and developing student feedback literacy through feedback interventions is rapidly developing, with at least ten studies published in 2021 alone. Yet, there is no evaluation of the current literature to understand which elements of feedback literacy can be targeted to enhance feedback behaviours, or how changes in feedback behaviour have been detected. This paper aims to explore key aspects of the development and implementation of feedback literacy interventions. The research questions addressed are:

RQ1: What are the nature and scope of feedback literacy interventions?

RQ2: Which elements of feedback literacy have been targeted by feedback literacy interventions?

## **Materials and methods**

### **Scoping review**

As empirical work on feedback literacy is relatively new and limited in scale, a scoping review was chosen as an appropriate method to investigate the scope and purpose of intervention studies, whilst focussing less on the quality of evidence provided. This type of review identifies key concepts that are fundamental to a research area, and examines available data (Mays, Roberts, and Popay 2001; Arksey & O'Malley, 2005). The function of a scoping review includes identifying gaps in the research, providing clarity concerning the topic of interest, and investigating the conduct of research in a particular area (Munn et al. 2018). As such, scoping reviews are a suitable way of investigating fields that are limited in scale, which can occur if an area has been developed recently like feedback literacy.

### **Search methods**

A preliminary search using Google Scholar was performed to assess relevant search terms. This initial exploration, as well as consultation with a university librarian, was used to inform the final search. The final search, which took place in September 2022, was conducted across seven databases: MEDLINE complete, APA Psycinfo, ERIC, Education Source, CINAHL Complete, Academic Search Complete and SCOPUS. The final search used key terms combined with Boolean Operators, as seen in Table 1. Additionally, a manual search of reference lists was conducted on the articles retrieved.

**Table 1.** Key terms to inform the final search.

Search terms	Boolean/phrase
Feedback literacy, student feedback literacy, student feedback, feedback capabilit**	'Feedback literacy' OR 'student feedback literacy' OR 'student feedback' OR 'feedback capabilit**'

**Table 2.** Inclusion and exclusion criteria.

Inclusion criteria:	Exclusion criteria:
<ul style="list-style-type: none"> <li>• Must be in higher education</li> <li>• Must be on the topic of enhancing or developing feedback literacy/capabilities/skills</li> <li>• Must be an empirical intervention</li> <li>• Must report feedback literacy outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Secondary education</li> <li>• Not on the topic of enhancing or developing feedback literacy/capabilities/skills</li> <li>• Conceptual paper</li> <li>• Does not report feedback literacy outcomes</li> </ul>

The search was confined to articles published in the last ten years (2011–2021) which includes the full period in which feedback literacy as such has been discussed. All publications were peer-reviewed journal articles or book chapters in the English language. Grey literature, records and conference proceedings were considered, however none were available at the time of the search.

### **Search criteria**

Table 2 outlines the search criteria that were applied.

### **Search process**

The records (articles) were identified in several steps. The initial search revealed 445 records (437 with duplicates removed), which were screened by title and abstract by the lead author. Following this, 82 records were screened by full text by the lead author, which resulted in further exclusion of 57. The research team then convened to discuss the remaining 25, which resulted in a further 9 records excluded. In total, 16 records met the criteria and were included for review. The search outcomes are reported in [Figure 1](#).

### **Data analysis**

As is typical with scoping reviews, data were analysed in several steps. To begin, a table was produced with general study information from each article, which included the author and year, theoretical perspective of feedback, research questions, method and data analysis used, and reporting of results. Following this, the data were extracted in spreadsheets to align with the two research questions. This further data included outcomes (difference in scores for quantitative and main themes for qualitative studies), implications (including limitations), and what the students did in each intervention (rationale for the activity structure and evidence of activity). The lead author undertook data extraction, and a team of four researchers contributed to the final analysis.

## **Results**

### ***RQ1 – nature and scope of feedback literacy studies***

#### ***General study overview***

Of the 16 studies, 11 were published in 2021, indicating the novelty of feedback literacy interventions as an area of study. 10 studies used a mixed method study design, whereas five and one used exclusively qualitative and quantitative methods respectively. Sample sizes ranged widely,

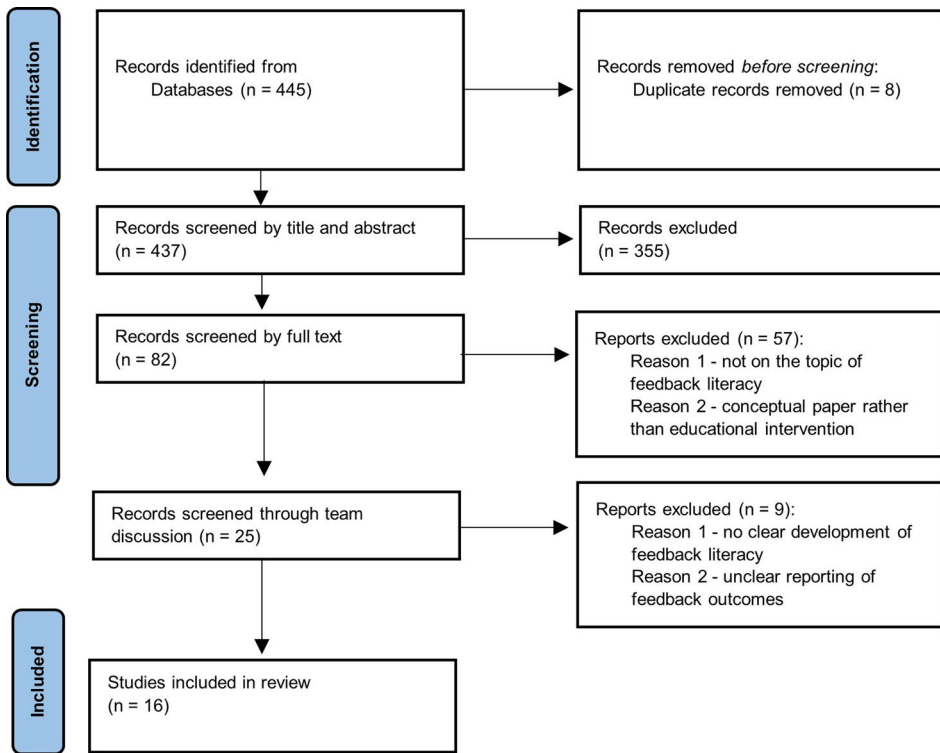


Figure 1. Flow diagram of the search process (Page et al. 2021; Haddaway, Pritchard & McGuinness, 2022).

with a minimum of four and a maximum of 383 ( $M=108.9$ ,  $SD=115.3$ ). The most frequent country of publication was the United Kingdom, closely followed by Australia. In terms of faculty or discipline, over half of the studies were conducted in a health-related field such as the health sciences, psychology, medicine or exercise/sports science. Other disciplines of note included languages and cultural studies. 15 studies were conducted with undergraduate students and 11 included an intervention that spanned over a semester. Of all the studies included, only one used an extension/replication design by incorporating an existing feedback literacy module. In terms of intervention design, studies used workshop activities, self and peer assessment, reflective diaries, education modules and the analysis of exemplars as the main pedagogical activities. Table 3 includes the nature and scope of included feedback literacy interventions.

### *Activities in which students engaged to develop feedback literacy*

Within each intervention, students were asked to engage in several different activities intended to enhance their feedback literacy. These activities were designed by the researchers according to the focus of each paper. For example, Noble et al. (2019) focused on previous literature that had stated student engagement with feedback was enhanced by workshop activities, whilst Hoo, Deneen, and Boud (2022) utilized self and peer assessment to align with the considerations to develop feedback literacy.

As a general overview, most interventions focused on enhancing student responsibility and understanding of their own learning. This was through self and peer assessment, and reflective activities. Self-assessment, which 'has been argued... contributes both to improving learning in the course being studied and providing a foundation for lifelong learning' (McDonald and Boud 2003, 211), involves students making judgements about the quality of their own work.

**Table 3.** Nature and scope of feedback literacy interventions.

Author & Year	Discipline	Study location	Participant study level	Total sample size	What were the tasks in the intervention?	How many tasks were in the intervention?	Intervention length
Deneen and Hoo (2021)	Cross-cultural management	Singapore	Undergraduate	51	Self-evaluation, peer-evaluation, reflective journals	3	Semester
Ducasse and Hill (2019)	Mixed	Australia	Undergraduate	50	Survey, writing assessment, quiz, textbook activity, survey	5	Semester
Fernández-Toro and Duensing (2021)	Language studies	UK	Undergraduate	383	Marking two exemplars, discussion on tutor-moderated forum	2	Two weeks
Hey-Cunningham, Ward, and Miller (2021)	Health	Australia	Postgraduate	22	Survey, workshop, survey	3	Three weeks
Hill et al. (2021)	Health and Geography	USA & UK	Undergraduate	19	Appointment with instructor action plan, semi-structured interviews, reflective diary	4	One academic year
Hoo, Deneen, and Boud (2022)	Cross-cultural management	Singapore	Undergraduate	79	Module, activity, writing assignment, video presentation, team ratings, reflective journals	6	Semester
Ma, Wang, and Teng (2021)	English	Hong Kong	Undergraduate	21	Pre-task guidance, draft-plus-rework, two-part tasks	3	Semester
Man, Kong, and Chau (2022)	English	China	Undergraduate	4	Training session 1 (briefing), Training session 2 (modelling and evaluating), Training session 3 (evaluation), interview	4	Unclear
Nicola-Richmond, Tai, and Dawson (2021)	Health	Australia	Undergraduate	52	Survey, seminar discussion, survey	3	Nine weeks
Noble et al. (2019)	Health	Australia	Undergraduate	105	Module, workshop, reflective activities	3	Three Semesters
Noon and Eyre (2020)	Health	UK	Undergraduate	87	Submit assessment, receive feedback reflection, receive grade, questionnaire, focus group	6	Semester
O'Connor & McCurtin (2021)	Health	Ireland	Undergraduate & Postgraduate	159	Module, upload feedback, reflection & action plan	4	Unclear
Tai et al. (2022)	Mixed	Australia	Undergraduate & Postgraduate	374	Study 1: survey, video + discussion, reflection tasks, discussion in workshops, survey, Study 2: survey, video, set goals, reflection, survey, Study 3: survey, 15-minute discussion, assessment	Study 1: 5, Study 2: 5, Study 3: 3	Semester
Tripodi, Vaughan, and Wospil (2021)	Health	Australia	Undergraduate	114	Peer feedback activity (assessment), module, survey	3	Two Semesters
Winstone, Mathlin, and Nash (2019)	Health	UK	Undergraduate	208	Survey, focus groups, workshop	Study 1: 1, Study 2: 1, Study 3: 3	One week
Wood (2021)	Academic writing	UK & South Korea	Undergraduate	14	Reflective writing task, request feedback comments, peer review discussions, reflection, survey, semi-structured interview	6	Semester



Peer-assessment is another formative method, defined as ‘an arrangement for learners to consider and specify the level, value, or quality of a product or performance of other equal status learners’ (Topping 2009, 20). Several interventions used these activities to foster feedback literacy (Hoo, Deneen, and Boud 2022; Deneen and Hoo 2021; Fernandez-Toro & Duensing, 2021; Man, Kong, and Chau 2022). In using an activity such as peer assessment, students were required to understand their role more fully as not just a user of feedback information, but as a feedback seeker and generator of information for others, leading to a stronger understanding of the feedback process and thus enhancing feedback literacy (Noble et al. 2019; Man, Kong, and Chau 2022).

Student reflection through the use of journals and discussion forums (Deneen and Hoo 2021; Connor & McCurtin, 2021) was also used to develop feedback literacy. When students thought about how they could or should be involved in the feedback process, as well as thinking about their current feedback behaviours and how to improve them, it was argued that it was transformational for them and provided fresh insights. For example, one student stated, ‘I understand that I have a bigger role in feedback than before and if I put in more, I get more out of it’ (Ducasse and Hill 2019, 32).

Discussion and dialogue surrounding feedback between both students and teachers was also used to develop feedback literacy. This approach helped sources of feedback information appear more integrated to the student. By encouraging students to become engaged in the feedback process, there were more opportunities for them to engage in face-to-face conversations with their educators about how to improve their work (Noon and Eyre 2020). Activities such as these led to students being able to make distinctions between feedback as a singular source of information and as a collaborative exercise (Connor & McCurtin, 2021). Both opportunities to discuss feedback with educators and workshops with researchers encouraged students to better align their feedback expectations (Ducasse and Hill 2019). Overall, the activities designed by the researchers followed from recommendations in the literature to improve feedback practices and were reported as successful in targeting different elements of feedback literacy.

### *How was student feedback literacy judged in the studies?*

Studies were based on different notions about what feedback literacy entailed, and thus it was judged in several different ways. The use of a self-report questionnaire to measure feedback literacy was the most common, with nine studies using some type of survey in their research. Questionnaires were used as a tool to assign feedback literacy a numerical value (Nicola-Richmond, Tai, and Dawson 2021), educate students about feedback literacy (Tai et al. 2022), or to understand student perceptions of feedback (Noble et al. 2019). Questionnaires were often supplemented with qualitative methods such as focus groups or interviews (Noon and Eyre 2020; Ma, Wang, and Teng 2021).

Some studies used peer marking to judge improvement of student action on feedback. For example, Tripodi, Vaughan, and Wospil (2021) measured student ability to give peer feedback by marking their performance on a rubric, which constituted 10% of the students’ grade. This was done twice to measure if the ability to provide peer feedback had increased after the implementation of a feedback literacy module. In a similar fashion, Fernandez-Toro and Duensing (2021) had students input marks for peer assessment, and then used the summation of these scores to see how students had improved their evaluative judgement after the peer marking exercises.

Another way to judge student feedback literacy was using reflective activities. Three studies used student journals to evaluate the development of feedback literacy, with two of the studies (Hoo, Deneen, and Boud 2022; Deneen and Hoo 2021) using them to track development over several time points. These studies used the journals as a basis for thematic coding, which enabled them to track the identification and development of feedback literacy capabilities (as conceptualized by Molloy, Boud, and Henderson 2020) over the course of the intervention. The third study also used a reflective diary as a data collection tool by including prompt questions for each student and then analyzing themes (Hill et al. 2021). Through measuring these elements



of student thought, studies were able to analyse how certain feedback behaviours developed or were likely to develop.

The final way in which feedback literacy was determined was through student perception, such as focus groups and interviews. Whilst some studies used a combination of both quantitative (survey) and qualitative (interview) methods (Noble et al. 2019), there were others that used self-reported student perception as the unit of measurement. These looked at how students viewed the technology used in the intervention and what they perceived to be helpful (O'Connor & McCurtin 2021), as well as how students thought they would behave in future feedback experiences (Ducasse and Hill 2019). Still others examined how students' attitudes and behaviours towards the feedback process had matured or changed through analyzing interview data (Hill et al. 2021).

In summary, conducting interventions to improve feedback literacy appears to be novel, with only 16 studies meeting the criteria for review. Of these, most focused on undergraduate students in the UK and Australia and had interventions that predominately consisted of self and peer assessment, discussion and dialogue with educators, and/or self-reflection. Feedback literacy was judged through student perception, questionnaires, collection of student artefacts from reflective activities, and improvement in peer marking.

## ***RQ2 - Which elements of feedback literacy have been targeted by feedback literacy interventions?***

Of the 16 studies included for review, most used the elements of feedback literacy proposed by Carless and Boud (2018), with some studies also linking to other frameworks (Molloy, Boud, and Henderson 2020; Chong 2021). Given the small number of studies in total, we make reference to all studies which discuss an aspect of feedback literacy in this section.

### ***Appreciating feedback processes***

Almost all studies reported that students had an improved perception of their future abilities when it comes to feedback, such as feeling more positively towards the process. This relates to an enhanced appreciation of the purpose of feedback (Carless and Boud 2018), which was explicitly discussed in some studies (Hill et al. 2021).

### ***Taking action***

Many studies found an increased level of student confidence, which was often linked to the increased probability of students acting on feedback in the future (Fernandez-Toro & Duensing, 2021; Hey-Cunningham, Ward, and Miller 2021; Ma, Weng & Teng, 2021; Tai et al. 2022). The notion of confidence appeared many times throughout the literature. This development could be due to education surrounding feedback and feedback literacy or encouraging students to become more intentional and self-aware surrounding their feedback role (Hoo, Deneen, and Boud 2022). This ties in well with some new feedback literacy scales, which measure feedback literacy using concepts such as self-efficacy (Song 2022).

### ***Making judgements***

Many of the tasks students were required to enact in interventions led to a development of evaluative judgement, which is 'the capability to make decisions about the quality of work of self and others' (Tai et al. 2018, 5). When students analysed exemplars or took part in peer marking, they were required to compare their own work to the standards of others (Fernandez-Toro & Duensing, 2021). The capacity of evaluative judgement was often measured by students' confidence, such as feeling more capable in making accurate judgements surrounding the quality of work of others and themselves.

### ***Managing affect***

The emotional impact of feedback was mentioned often by students. Hill et al. (2021) found that students wished to discuss emotions during the feedback process with their instructors, whilst both Nicola-Richmond, Tai, and Dawson (2021) and Tai et al. (2022) found emotional descriptors throughout their survey responses, such as students feeling angry or silly.

Overall, most studies found evidence that their intervention had improved student understanding and appreciation of their role in the feedback process, and that student confidence had increased which could influence their participation in future feedback activities.

### **Elements that were less studied**

Despite enhanced student confidence and the intention to act on feedback in the future, it appears that directly tracking the actions students take was missing from most of the studies, with only two studies indirectly tracking behaviour, and only through the use of peer marking (Tripodi, Vaughan, and Wospil 2021; Fernandez-Toro & Duensing, 2021). Instead, many studies looked at student perception of taking action in the future (Hey-Cunningham, Ward, and Miller 2021). This means that there is no direct evidence that interventions changed student behaviour. In addition, hardly any studies explicitly examined the effects of their intervention on improving or changing emotional responses. Whilst some studies noted that emotion was present, they did not delve further into how affect or capabilities in regulating affect were impacted by the intervention. Overall, questions remain surrounding the emotional and behavioural side of feedback literacy.

### **Discussion**

Across the 16 studies, it appears that students were able to develop certain capabilities of feedback literacy, such as appreciating the purposes of feedback, having more confidence and agency surrounding their feedback role, and understanding how to act appropriately in future feedback experiences (Hill et al. 2021; Tai et al. 2022), and that this may have been a result of their participation in feedback literacy interventions. Several key considerations were identified that have implications for future research and practice.

### ***Conceptualizing and measuring feedback literacy***

Studies conceptualized feedback literacy in different ways. Regardless of which conceptualization was used (Carless and Boud 2018; Molloy, Boud, and Henderson 2020), studies which clearly defined their stance on the concept of feedback had a strong and succinct reporting of results. For example, Ma, Weng and Teng (2021) used Chong's (2021) ecological model to explore why feedback literacy developed in their students through the alignment of learner and contextual factors, which led to a clear explanation as to the occurrence of feedback literacy. Others used categories of the Molloy, Boud, and Henderson (2020) conceptualization to clearly identify and track how feedback literacy had developed over different time points (Hoo, Deneen, and Boud 2022; Hoo & Deneen, 2021). Thus, it appears that having a clear conceptualization of feedback literacy also meant that studies were able to more accurately judge it, as these records had a set of criteria to observe in student responses (Nicola-Richmond, Dawson & Tai, 2021). Future studies should be clear surrounding their conceptualization of feedback literacy, which will influence how it is measured, and how findings can be synthesised across studies.

Another consideration surrounding how feedback literacy was judged was whether it was separated into isolated elements or measured as a whole construct. Some studies focused on different facets of feedback literacy, such as managing emotional responses (Hill et al. 2021) or understanding beliefs and attitudes (Noon and Eyre 2020). Others focused on feedback literacy

as a whole concept, such as Tripodi, Vaughan, and Wospil (2021) and Tai et al. (2022). Regardless of whether feedback literacy is measured in isolation or as a whole construct, it is necessary that future studies specify this information to the reader. This can lead to better clarity of results, as discussing the whole concept of feedback literacy but only reporting on certain outcomes leaves room for confusion.

### ***Quality of evidence***

Whilst scoping reviews are not required to comment on the quality of evidence (Arksey & O'Malley, 2005), it can still be helpful to do so. Whilst some studies directly asked students what they thought about feedback at multiple time points (Nicola-Richmond, Dawson & Tai, 2021), others inferred what students thought about feedback from selected quotes. (O'Connor & McCurtin, 2021). This method of data collection can be problematic, as it encompasses some challenges when considering feedback literacy. Firstly, some students may be unaware or have their own views of the language surrounding what constitutes feedback, and consequently may have a different definition compared to the researcher, meaning that their perceptions of the feedback process may be undetected or misinterpreted when using a-priori coding methods. We would encourage great care in the use of the term 'feedback' in future data collection with students, as their understanding of the term may differ greatly from the researchers'. For example, they may hold the view that feedback merely refers to the comments of teachers and not the whole feedback process they need to engage in.

Secondly, if the empirical intervention is designed with the purpose of producing an increase in feedback literacy behaviours, then some type of data analysis must occur that considers the differences pre and post intervention. For example, student perceptions or performance could be measured at the beginning of the intervention, during the intervention and post intervention. This was often not the case (O'Connor & McCurtin, 2021), meaning that improvement in feedback literacy behaviours could not be identified. Some studies in the wider literature may have focussed on improving feedback behaviours, but did not use the term 'feedback literacy' and were not included in this review. Thus, future studies should scope feedback studies more broadly, but continue to consider the specific goals chosen for the empirical intervention to ensure that the research design is consistent with these.

### ***The emotional impact of feedback***

For students to understand and deal with their emotions surrounding the feedback process, some degree of feedback literacy is required (Carless and Boud 2018). However, it appears that emotional responses to feedback, and the mechanisms needed to deal with these, are less clear in feedback literacy research. Whilst student emotions surrounding feedback were mentioned (Hill et al. 2021; Nicola-Richmond, Tai, and Dawson 2021), how students managed their affect during and after the intervention was not typically discussed. Emotions are either seen as something to be overcome or managed, or something that may interfere with logical reasoning (Molloy, Boud, and Henderson 2020). Rather than view emotion as a central part of the process, oftentimes it is conceptualized as the 'problem when feedback goes awry' (Ajjawi, Olson, and McNaughton 2022, 485). Current views of emotions in the feedback process recognize this difficulty but contend that emotions should not be viewed as the learner's problem, as this stops educators and institutions from taking responsibility. Instead, the emotional impacts of the feedback process should be recognized as inseparable from the process itself, and the goal should not be to overcome these feelings but to understand that they are resources from which students can learn. Thus, future studies should pay attention to students' emotions, and report these pre- and post-intervention.

It appears that each facet of student feedback literacy may need further empirical investigation, especially that of regulating affect.

### ***Recommendations for future feedback literacy studies***

Several studies had their own recommendations for future interventions. A large majority indicated that time constraints were an issue in their study design, recommending that longitudinal data would have been more beneficial in evaluating the effectiveness of the intervention (Winstone, Mathlin, and Nash 2019; Nicola-Richmond, Tai, and Dawson 2021). Many studies commented on teacher feedback literacy and support as drivers for developing feedback literacy in students, noting that supportive teacher-student relationships were imperative (Deneen and Hoo 2021; O'Connor & McCurtin, 2021). Lastly, many studies advised that the intervention must be replicated in a wide range of communities and contexts, to assess how the intervention would affect feedback literacies in different populations (Hey-Cunningham, Ward, and Miller 2021).

The results of the review demonstrate that feedback literacy capacities can be successfully improved in a range of students, but there are still significant deficiencies in the literature. To address these, future feedback literacy intervention studies should consider the following:

1. Specify the conceptualisation of feedback literacy used

Studies should be clear about which model of feedback literacy they are using to conceptualize their study, as this will often influence how feedback literacy is measured. If studies are clear about which elements of feedback literacy they are targeting and the purpose of their exploration, results can be interpreted with more clarity and integrated with other research more easily.

2. Clearly target specific elements of feedback literacy

As feedback literacy can be divided into different elements or capacities, studies should be clear on which elements they target in their intervention. In doing so, it can be more apparent which elements of feedback literacy have been studied.

3. Evaluate existing instruments

Several studies within the review indicated that no validated feedback literacy instruments were available at the time of publication and recommended that future studies either replicate instruments or complete thorough validity testing (Winstone, Mathlin, and Nash 2019). Now that four different feedback literacy scales have been published (Zhan 2021; Liao 2021; Yu, Zhang & Liu, 2022; Song 2022) future studies should carefully evaluate whether the scales align with their conceptualisation of feedback literacy, as well as the purpose of their intervention. It may be that alternative instruments for student feedback literacy need to be created. When a consistent range of instruments are used, it will be possible to assess and compare the efficacy of interventions in different populations, and over different time points.

### **Conclusion**

Empirical work into the development of interventions to foster student feedback literacy is promising. Of the 16 studies reviewed, many had important implications for understanding how feedback literacy can be developed. This review displayed evidence that many positive feedback behaviours, such as managing perceptions and attitudes, improving understanding of the student role, and having more confidence and agency in the feedback process, may be improved

through participation in feedback literacy interventions. Through this work, several recommendations for future practice were noted, such as having clear conceptualisations of both feedback literacy and the elements to be studied and evaluating whether existing scales should be used in empirical work. Both improved study design and improved intervention design are required to make the most of the significant energy being invested into feedback literacy research.

## Disclosure statement

No potential competing interest was reported by the authors.

## Notes on contributors

**Tegan Little** is a PhD Candidate with the Centre for Research in Assessment and Digital Learning (CRADLE) at Deakin University. Her research focuses on student feedback literacy and peer feedback.

**Phillip Dawson** is a professor and the associate director of the Centre for Research in Assessment and Digital Learning (CRADLE) at Deakin University. His research focuses on assessment, feedback, and cheating.

**David Boud** is Alfred Deakin Professor and Foundation Director of the Centre for Research in Assessment and Digital Learning (CRADLE) at Deakin University, Melbourne, he is also an Emeritus Professor at the University of Technology Sydney and Professor of Work and Learning at Middlesex University, London.

**Joanna Tai** is a Senior Research Fellow at the Centre for Research in Assessment and Digital Learning (CRADLE) at Deakin University. Her research interests include student perspectives on learning and assessment, peer-assisted learning, feedback and assessment literacy, developing capacity for evaluative judgement, and research synthesis.

## ORCID

Tegan Little  <http://orcid.org/0000-0002-7876-0304>  
 Phillip Dawson  <http://orcid.org/0000-0002-4513-8287>  
 David Boud  <http://orcid.org/0000-0002-6883-2722>  
 Joanna Tai  <http://orcid.org/0000-0002-8984-2671>

## Data availability statement

The authors confirm that the data supporting the findings of this study are available within the article.

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