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Application of feedback principles to marking proformas increases student efficacy,
perceived utility of feedback, and likelihood of use.

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Abstract

Pedagogical and psychological literature identifies numerous factors contributing to feedback effectiveness, including type, frequency, and specificity (e.g., Gibbs & Simpson, 2004). Despite this wealth of research, feedback practice at universities is often reported as problematic or poor by students (NSS; Williams & Kane, 2008; 2009) despite lecturers perceiving their feedback as useful (Carless, 2006; Maclellan, 2001). The present research employed a quantitative counterbalanced experimental design to compare the perceived utility of a pedagogically informed feedback proforma, designed to provide detailed, timely, and constructive feedback, to standard practice. Results suggest that the presentation of feedback is important to students; more functional and comprehensible feedback increases the likelihood of students using the feedback provided, and can reduce likely marking time per script without compromising perceived feedback quality. Further to this, post-submission feedback proformas increase students' confidence in their ability to complete the assignment when provided alongside the assignment title. In summary, the research supports the application of principles of feedback in the provision of summative feedback to enhance students' likelihood of use, perceived value of the feedback received, and confidence.

Key words: *feedback, student motivation, student satisfaction, student confidence.*

Introduction

Feedback is a critical part of a student's learning process (Hattie, 1987; Merry, Price, Carless, & Taras, 2013), and as such the process of providing students with effective feedback has been widely researched within pedagogical literature (e.g., Kluger & DeNisi, 1996; Hattie & Timperley, 2007; Shute, 2008). Students similarly regard feedback as an important aspect of their learning, one that is currently not being satisfied as highlighted through low satisfaction scores for "assessment and feedback" in the National Student Survey (NSS; Williams & Kane, 2009; Maggs, 2012; Neves & Hillman, 2017). Other evidence also suggests that feedback practices in higher education are often not to an adequate standard (Osney Grange Group; OGG, 2009).

Providing students with more effective feedback (e.g., helpful, timely and focused on improvements) has been highlighted as an important area for higher education institutions to focus on (Nicol & MacFarlane-Dick, 2006; Brown, 2015). Many higher education institutions have taken a proactive approach to improving this aspect of a student's learning experience by designing principles of effective feedback. For example, feedback should: be transparent, easy to understand and related to assessment criteria, identify areas of strength and where improvements can be made, and be appropriate for the assessment (e.g., Aberystwyth University, 2016; Northumbria University, 2013; University of Strathclyde Glasgow, 2014). These principles are consistent with theoretical and empirically-developed models of effective feedback. For example, Gibbs and Simpson (2004) highlighted seven key conditions in which feedback supports learning; five relating to the manner in which

external feedback is delivered (sufficient detail, timely manner, learning focused, linked to the purpose of the assignment, and understandable), and two related to how the feedback is used (received and attended to by students, and acted upon to improve work and learning). It is particularly important that educators' feedback satisfies Gibbs and Simpson's first five conditions as these are within the educators' control and may increase the likelihood of the latter two conditions occurring (i.e., students attending to and acting upon the feedback given).

Providing students with feedback that is of sufficient detail, linked to the assessment, and is learning focused, are important considerations. To achieve these criteria, feedback must be specific and provide the learner with information regarding strengths, weaknesses, and ways to reduce discrepancy between current and expected level (Shute 2008; Hattie & Timperley, 2007). For example, "the introduction lacked depth" or "the introduction was strong" is not sufficient. Effective feedback should be constructive, informing the learner specifically what was good (e.g., concisely written, critical discussion of the literature, creative applied implications) or poor (e.g., structure does not follow that required for a lab report, missing key definitions of the theory and key research by...). To aid this process, Voerman, Meijer, Korthagen, and Simons (2012) suggest utilising progress feedback; emphasising what has already been achieved, and discrepancy feedback; emphasising what is still to be achieved. The use of progress and discrepancy feedback provides the opportunity for students to close the gap between the current and desired performance, which is an important aspect of the learning cycle (Nicol & Macfarlane-Dick, 2006).

A key aspect of providing effective feedback is the frequency and volume of feedback given. It is generally assumed within pedagogical literature that more feedback enhances learning through providing more information that students can use

and learn from (Salmoni, Schmidt, & Walter, 1984; Bilodeau, 1966). However, more recently, research has shown that feedback frequency and learning have an inverted-U relationship. Specifically, there is an optimum amount of feedback that can be used by students, after this point the cognitive demand on the student to process and respond to feedback becomes overwhelming and can result in reduced task effort, feelings of debilitation, and increased anxiety (Lam, DeRue, Karam, & Hollenbeck, 2011; Scott, Hughes, Evans, Burke, Walter, & Watson, 2013).

Gibbs and Simpson (2004) also state that it is essential that feedback is provided in a timely manner thus allowing students to use the feedback received to aid performance in future assessments. Feedback that is received weeks after submission is often ignored by students as they might not remember what the piece of work was assessing, how they felt they had performed, or believe that the feedback has little relevance to their current needs (Race, 2010).

The final two conditions for effective feedback, as discussed by Gibbs and Simpson (2004), are reliant on the student to be willing to read/listen to, attend to, and act upon the feedback. An issue that consistently occurs in higher education is that students report concern only about their assessment marks, as opposed to the accompanying feedback (Crooks, 1988; Sambell, 2016). This is especially problematic for final year students believing that feedback will not be of any benefit as they have no similar future assessments. Research has shown some effective methods that can be employed by educators to ensure learners read and attend to feedback, for example, two stage submission (stage one providing formative feedback with no mark and stage two providing a summative mark without feedback; Cooper, 2000; Carless, Salter, Yang & Lam, 2011), and, providing the assessment grade after students have self-assessed their work and received tutor feedback (Taras, 2001).

However, these methods can place extra time demands on lecturing staff, and may not be suitable for all assessment formats.

One approach to improving likelihood of using feedback is to increase students' confidence in their ability to utilise the information provided. Educators and the learning environment they create play an important role in developing students' confidence (Patrick, Turner, & Strati, 2016), for example, considering task difficulty (Csikszentmihayli, 1990), using comments to provide competence support, providing structure to scaffold development, praising effort/personal improvement, and providing informational feedback (self determination theory; SDT; Deci & Ryan, 1985, 2000; Niemiec & Ryan, 2009). The need for competence is central to self-determination theory, the satisfaction of which is associated with more self-determined behaviours, well-being and interest (Deci & Ryan, 1985; 2000).

An often-overlooked aspect of developing competence is the impact of structure. Students' competence can be supported by structure, providing a sense of predictability and order, allowing students to focus on learning (e.g., clear goals, attainable and coherent expectations, providing scaffolding and conveying informational feedback; Jang, Reeve, & Deci, 2010; Reeve & Cheon, 2014). These practices of promoting structure are often considered in the design and delivery of the learning environment, but perhaps not as considered in the provision of written summative feedback.

As such, academics are faced with a daunting task: how to provide detailed, timely, learning focused feedback during a period of increasing student numbers with higher demands and expectations, putting value under increasing scrutiny (UCAS, 2016, Neves & Hillman, 2016). The Student Academic Experience Survey suggests that students typically wait three weeks to receive feedback, but believe they should

have work returned more quickly (within two weeks), whilst only 35% of students believe that staff put time into commenting on student work (Neves & Hillman, 2016). Addressing this challenge is especially problematic for universities with high staff to student ratios (staff student ratios range from 11.1 to 26.2 across UK institutions; The Guardian, 2017) due to the relationship between increasing work demands and student expectation and academics' experience of stress, anxiety and reduced job satisfaction (Kinman & Jones, 2003).

It is in such a context that learning from sport and exercise psychology can provide additional direction. Sport and exercise psychologists have useful knowledge regarding, for example, how best to tailor feedback across stages of learning (e.g., Wulf, Shea, & Matschiner, 1998), the impact of feedback frequency (e.g., Anderson, Magill, Sekiya, &, Ryan, 2005), style (e.g., positive or controlling: Viciane, Cervello, & Ramírez-Lechuga, 2007) and its nature (e.g., contingent or controlling: cf. Deci & Ryan, 2000). Despite this wealth of knowledge, application of principles across performance and training into educational contexts can be implicit, sporadic, or non-existent. We argue here that explicitly designing feedback resources using available psychological and pedagogical knowledge is likely to improve students' responses to the feedback, their likelihood of using it, and their resultant confidence in their ability to use it.

In sum, providing students with effective feedback in a timely manner is an important topic within pedagogical literature, to universities and, most importantly, to students' learning and satisfaction (OGG, 2009; Williams & Kane, 2008; 2009). The aim of the present research was to assess if a feedback proforma explicitly incorporating principles of effective feedback, can i) be perceived as more functional, easier to use, and increase the likelihood of students using the feedback ii) reduce

perceived marking time while improving/maintaining quality of feedback, and iii) increase students' confidence in their ability to complete the assignment. It was hypothesised that improving the areas of feedback that are in control of the educator will increase the likelihood of students attending to and acting upon the feedback provided. Specifically, improved functionality and ease of use of feedback will improve the utility of feedback which can thus increase likelihood of use.

Method

Development of Assessment Proforma

The standard non-principle driven feedback template used as a control condition consisted of five open-ended section titles: general comments, content, use of literature, presentation and structure, and referencing. Several limitations are associated with this structure, for example: time consuming to complete, feedback is often repetitive in nature (e.g., lab report; failed to discuss the reliability of measures used, poster; limited consideration of design), and potentially overwhelming for the student (i.e., paragraphs of information about the assessment as a whole). Further to this, the assessment proforma failed to link the expected assessment components to the learning outcomes, as such, constructive alignment was low which impacts several principles of effective feedback (e.g., not learning focused, not linked to purpose of the assignment, impacts on coherency of expectations, and ultimately may reduce students' understanding).

Three key adaptions were made to create the pedagogically informed feedback proforma, which was designed for a laboratory report assignment¹: i) the content section was separated into four sections (introduction, method, results, and discussion) thus aligning the structure to a laboratory report, and with the marking criteria (Shute, 2008; Hattie & Timperley, 2009); ii) a Likert scale was used to

indicate performance in relation to all aspects of writing a scientific laboratory report. This increased the speed of providing feedback and providing a manageable and comprehensible volume of feedback to all students (Lam et al., 2011); finally, iii) each section contained three stems: “continue to”, “start to” and “stop” to ensure feedback was specific and constructive (a method effective at producing more constructive student-provided feedback; George & Cowan, 1999; Hoon, Oliver, Szpakowska, & Newton, 2015). The use of the Likert scale and ‘traffic light system’ provides students with progress and discrepancy feedback in a manageable volume (Voerman et al., 2012).

The pedagogically informed feedback proforma was reviewed by three peer academics within a Sport and Exercise Department. The reviewers ranged in lecturing experience (one to over 10 years), all had experience in providing feedback to students and interests in teaching and learning (HEA Fellows or working towards Fellowship). Reviewer comments supported the adaptations, endorsing that the content covered the key aspects of a laboratory report whilst the structure allowed for breadth and depth of feedback to highlight areas for development.

Participants

Following departmental level ethical approval, an opportunistic sample of forty-five Sport and Exercise Science undergraduate students were recruited during a seminar session in the second semester of the academic year (first year = 38, second year = 7). No course credit was given for participation, and students could elect not to participate.

Measures and Materials

Assessment Feedback Proforma. The standard (five open-ended section titles: general comments, content, use of literature, presentation and structure, and referencing) and pedagogically informed feedback proforma were populated with identical, fictional feedback. For example, the standard proforma contained a short paragraph, around six sentences, discussing the presentation and structure of the lab report. The pedagogically informed proforma contained seven stems (e.g., clarity of writing, use of scientific language, appropriate use of headings) rated on a 1 (poor) to 4 (very good) Likert scale. A short statement to provide examples of the ‘continue to’ ‘start to’ and ‘stop’ stems was also included (e.g., ‘Continue to: format your tables following APA guidelines’, ‘Start to: consider your use of scientific language, for example, “the literature supported” rather than “the literature backed up”’ and ‘Stop: including gridlines on figures. Consult APA guidelines’).

Functionality. Consists of five items assessing the functionality of the feedback received. The items were developed in line with Gibbs and Simpson’s (2004) effective feedback principles (e.g., “provided sufficient detail of performance”, “provided areas to improve” and “was understandable”). Each item was rated on a 1 (*not at all*) to 5 (*very much*) point Likert scale.

Ease and Likelihood of Use. Participants were required to respond to two items assessing the likelihood of using the feedback provided and how easy it was to focus on areas to improve. Each item was rated on a 1 (*not at all*) to 10 (*very much*) scale.

The *Biology Self-Efficacy Scale (BSES; Baldwin, Ebert-May & Burns, 1998)* was adapted to assess students’ confidence to write and critique a laboratory report. The

measure consists of four items assessing confidence to write each main section of a laboratory report (i.e., introduction, methods, results, and conclusion) and three items relating to confidence to critique/tutor other students (e.g., “critique a laboratory report written by another student” and “tutor another student to write a laboratory report”). Participants responded to each item on a 1 (*not at all confident*) to 5 (*totally confident*) point Likert scale. The scale has demonstrated satisfactory internal reliability in its measure development phase ($\alpha = .88$; Baldwin et al., 1998).

Procedure

The research was conducted during a seminar at a mid-point of the second semester of the academic year, prior to any assessment focused sessions. Participants read the fictional feedback presented on the standard and pedagogically informed feedback proforma in a randomised and counterbalanced order. After reading each feedback proforma students completed the BSES, Functionality, and Ease and Likelihood of Use Scales in a non-randomised order.

Design and Data Analysis

The data were collected using a quantitative counterbalanced experimental design. To examine if students’ confidence, perceived functionality, ease, and likelihood of use differed between the standard and pedagogically informed feedback proforma, paired samples t-tests were performed. Bivariate correlation analyses examined the relationship between feedback perceptions and likelihood of use. A significance level of .05 was used. Staff experiences of using the pedagogically informed proforma were collected qualitatively through informal, written reflections.

Results: Students

T-tests revealed that the pedagogically informed proforma was associated with significantly increased perception in functionality in use ($t(43) = 7.89, p < .001$), likelihood of use ($t(44) = 7.02, p < .001$), ease of use ($t(44) = 7.75, p < .001$), and confidence to write laboratory reports ($t(43) = 6.75, p < .001$), in comparison to the standard feedback proforma.

INSERT TABLE 1 HERE

Results revealed a significant moderate positive correlation between the perceived functionality of the assessment proforma and likelihood of use of feedback ($r = .467, n = 45, p = .001$) and a significant large positive correlation between ease of feedback use and likelihood of use of feedback ($r = .816, n = 45, p < .001$). There was a nonsignificant small positive correlation between students' confidence and likelihood of use of feedback ($r = .265, n = 45, p = .083$).

Experiences of Use: Staff

Staff perceptions of the feedback proforma were assessed in two ways: first, to pilot ease of use in practice the proforma was administered by two staff within a Sport and Exercise Psychology module, and second, to evaluate potential adaptability across assessments and modules, the proforma was circulated to all lecturing staff within the department (nine full time academics ranging from one to over 10 years teaching experience; all staff are or working towards or have achieved Fellowship of the HEA).

Both module markers using the proforma in practice reported finding the adapted feedback proforma beneficial, and perceived that the Likert scale increased the speed of marking relative to previous years. The "stop", "continue to", and "start to" headers were perceived to provide more constructive feedback generation and

reduce the number of vague comments (e.g., more detail needed). This is consistent with previous work demonstrating that ‘stop, ‘continue’ ‘start’ structures generate more detailed and constructive student-provided feedback when compared to unstructured open-text response options (Hoon, Oliver, Szpakowska, & Newton, 2015).

The wider staff feedback was also positive, with staff using the proforma with no/small amendments (e.g., physiology focus as opposed to psychological). One member of staff raised concerns regarding the use of the feedback proforma across levels of study. Specifically, while it was perceived as being appropriate for first year students, who may need to learn the structure of laboratory reports, they would have been hesitant to use the proforma with second and third year students believing that the structure should by then have become an 'ingrained' skill. This point is expanded on in the discussion below.

Discussion

The research provides support for the research hypotheses. The pedagogically informed feedback proforma generated more functional and useable feedback, which increased students' ratings of their likelihood of using it. Students were also more confident about their ability to use feedback provided in this way. The ease of use of the structured proforma was also rated positively by academics. Taken together, the results suggest that students show a preference for a more structured, concise, and 'user friendly' feedback proforma in comparison to more open ended structures. It is posited that the minimalistic presentation of feedback does not overwhelm the students with blocks of texts (Lam, DeRue, Karam, & Hollenbeck, 2011). Much like producing an effective flyer, brochure, or media campaign (e.g., Information Design; Black, Luna, & Walker, 2017), the feedback assessment proforma needs to

immediately capture the students' attention, as opposed to being a daunting task to read. This is also aligned with theoretical models emphasising the positive impact of structure on feelings of competence (Deci & Ryan, 2000), and work demonstrating that irrespective of the learning theory applied (i.e., behaviourism, cognitivism, social cultural theory, meta cognitivism and social constructivism) effective feedback is task-directed and specific (Thurlings, Vermeulen, Bastianens, & Stijnen, 2013).

One academic raised the issue of providing students with 'too much help', arguing that a laboratory report structure should become an ingrained skill for second and third year students. However, this belief contrasts with pedagogical research that supports the benefits of increasing the constructive alignment within the module, increasing the likelihood of students using the feedback provided, and increasing students' confidence in their ability to complete the assignment.

A limitation of the current research is that the feedback proforma was presented in a hardcopy format, therefore, the functionality of the electronic feedback proforma from the view of the marker and student has not yet been assessed. The structure could be easily incorporated into electronic systems that are now widely used in UK institutions. Future research should consider students' perceptions of the functionality and ease of use when reading feedback electronically and the presentation of feedback when producing hardcopy documents from the electronic system. The present research assessed perceived likelihood of use, and so it is unclear if these behavioural intentions would result in the actual behaviour (referred to as the intention-behaviour gap), however the increased confidence, evidenced when using the pedagogically informed feedback proforma, might mediate this relationship (Sniedotta, Scholz, & Schwarzer, 2005). Of importance for future pedagogical research would be to examine if the structured feedback proforma facilitated learning,

or if feedback presented in this manner discouraged independent analysis and reflection by the student.

The use of an opportunistic sample of students who attended a seminar session at a mid-point of the second semester is a limitation. It is likely that these students are more engaged and potentially intrinsically motivated, thus more likely to engage with the feedback they receive, in comparison to students who do not attend their timetabled taught sessions. Using a repeated measures counterbalanced design attempted to mitigate for this. The number of students in attendance also resulted in a relatively small sample size, as such, results should be interpreted with caution.

In conclusion, the findings reported here support utilising principles of feedback in the provision of summative feedback to enhance students' likelihood of use, perceived value of the feedback received, and confidence. Whilst structure is often considered in the design and delivery of the learning environment, the present research demonstrates that providing structured summative feedback might also be important in maximising students' understanding of their actual and required competencies, their perceptions of the utility of feedback they receive, and most importantly their likelihood of using the feedback in subsequent academic practice.

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Footnote

¹Whilst the pedagogically informed feedback sheet has been used to assess a laboratory report style assignment in the present research it can be easily adapted, through the stems and section headers to fit numbers, assessment types (development of health promotion campaigns, grant applications and client reports) and delivery methods (e.g., written, vivas, practical assessments and presentations).

Table 1: Summary of means and standard deviations from paired samples t-test.

Outcome	Standard Feedback Proforma	Pedagogically Informed Proforma
	M (SD)	M (SD)
Functionality	17.98 (3.51)	23.34 (2.96)

Likelihood of use	5.71 (1.98)	7.76 (1.33)
Ease of use	4.91 (1.96)	7.67 (1.61)
Confidence	4.00 (2.79)	8.00 (2.66)