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The effect of feedback type on academic performance

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Abstract

Feedback is arguably the most important aspect of an assessment process, but its impacts are highly variable. Audio and face-to-face feedback have been suggested as possible alternatives to written feedback, however, very little is known about the impact of these types of feedback on students' academic performance. The aim of this study was to investigate the impact of three types of feedback (written; audio; and face-to-face) on the academic performance of year 3 (level 6) undergraduate students**.** This study recruited 91 physical education students from a University in the South of England. The participants completed two assessments (A and B) that were assessed according to the same assessment criteria. Following Assessment A the participants received either written feedback, audio feedback, or face-to-face feedback. The participants were advised to utilise the feedback to positively impact their academic performance in Assessment B. The effect of the feedback on participant grades between the two assessment points was measured. Analysis of the results showed a significant effect depending on the feedback type. Written feedback had a limited impact

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on the assessment grade, whilst both audio and face-to-face feedback resulted in a significant improvement in the assessment grade. The findings suggest that audio and face-to-face feedback could potentially provide a way to improve academic performance. However, it is important to recognise that other confounding factors, such as the novelty of the audio and face-to-face feedback and how participants utilise the feedback, could have impacted the findings of this investigation.

Keywords: audio feedback; written feedback; face-to-face feedback; academic performance; summative assessment; formative assessment.

Introduction

Feedback is a crucial aspect of the teaching and learning process as it can be used by students to improve their academic performance (Taras, 2005; Molloy & Bound, 2013). The aim of feedback is to bridge the gap between actual levels of performance and the desired learning goals (Lizzio & Wilson, 2008). For this to be achieved, it requires the engagement of the tutor and student. One could argue therefore that it can only be called feedback if it is an active shared process that has an impact on learning. The type of feedback provided may influence student engagement with the feedback process. Although written feedback currently dominates in universities, other forms of feedback also exist, including the use of recorded audio files (Lunt & Curran, 2010) and face-to-face dialogue (Nash, Liebergreen, Turley, Grimmins, Bond, Oprescu & Dunn, n.d).

Tutors spend considerable time constructing feedback in the form of written comments on assignments (Nicol, 2010). However, tutors have stated that some students do not collect their feedback, whilst others who do access the feedback do not seem to act on the guidance provided only paying attention to the allocated grade (Timmers & Veldkamp, 2011). A key consideration is that students can only make improvements if they actively receive, digest, and act upon feedback (Winstone, Nash, Parker & Rowntree, 2017). The challenge for tutors is therefore to develop efficient feedback methods that students will engage with.

Being able to act on feedback and make changes requires the feedback to be timely (Carless, 2006). Most feedback is given on summative assessment after submission but this is too late for students to make changes to their work. The compartmentalised nature of learning through semesters compounds this problem making it hard for students to understand how feedback on their learning in one module has relevance for their future learning. Possible solutions include formative feedback partway through a semester or having two summative assessment points where feedback from the first directly links into the requirements for the next assessment.

When we receive feedback we often interpret it at a personal level rather than at a task level (Kluger & DeNisi, 1996). Students therefore need time to process the emotions of feedback before thinking about the next steps in developing their work. Assessment design must take account of this, providing early opportunities to receive feedback whilst there is sufficient time to use it (Evans, 2016). With constructive guidance on how to improve future assignments provided in a timely manner feed-forward can foster student learning improvement (Ferrell, 2013).

Written Feedback

Most of the assessment feedback in UK Higher Education is provided in written form, which is being increasingly delivered electronically (Cann, 2014). Often, the feedback consists of notes on the text or a summary of comments from the tutor to the student, or a combination of the two (Bailey & Garner, 2010). However, there are some concerns about the effectiveness of this delivery type. One limitation of this approach is that it represents a ‘transmission’ model which is in conflict with constructivist principles (Sadler, 2010). This results in a monologic discourse rather than a dialogue between tutor and student (Nicol, 2010). The absence of this critical dialogue could lead to a lack of understanding of the written feedback and therefore students may experience a general dissatisfaction with the feedback process (Rodway-Dyer, Knight & Dunne, 2011). A further concern is the use of academic jargon when providing written feedback and this has the potential to make it inaccessible to some students (Sadler, 2010). This may explain, in part, the lack of student engagement with written feedback, particularly

for students with lower academic ability who may find it difficult to interpret the feedback (Orsmond & Merry, 2009).

Audio Feedback

Audio feedback has been proposed as a type of feedback that could be beneficial for student learning (Gould & Day, 2013). Audio feedback is defined as formative and/or summative information that is presented to learners as a digital audio file in response to both on-going and submitted work (Middleton & Nortcliffe, 2010). It has been reliably evaluated by students as being richer than other forms of feedback (King, McGugan & Bunyan, 2008) and students have described the experience of receiving audio feedback as personal, enjoyable, complete and clear (Kirschner, van den Brink & Meester, 1991).

A crucial benefit of applying audio feedback is that it allows students to detect nuance and inflection in the comments that a tutor provides (Ice, Curtis, Wells & Philips, 2007). It has been found that students believe that the audio feedback gives them an increased insight into what the tutor is trying to convey and leads to a more comfortable, less formal learning environment (Ice et al., 2007). Another benefit that has been suggested for utilising audio feedback is that it allows students to access feedback quickly through an electronic device such as a smartphone (McCarthy, 2015). Furthermore, it has been observed that audio feedback is significantly more time efficient than written feedback, with more volume of feedback conveyed in a shorter time, allowing a more in-depth and detailed review of students' work (Emery & Alkinson, 2009). Although a number of benefits have been recognised, audio feedback does have some limitations. It is unsuitable for students with hearing impairments (Lunt & Curron, 2010); there can be technical issues such as uploading large audio files (Merry & Orsmond, 2008); and some students would prefer to have written notes to refer back to (Rodway-Dyer, Knight & Dunn, 2011).

Face-to-Face Feedback

Face-to-face feedback is a two-way process that aims to support dialogue between student and tutor (Nash et al, n.d). The value of face-to-face feedback is largely agreed upon and its benefits include the opportunity for questioning and discussing the feedback to clarify misconceptions (Orsmond, Merry & Reiling, 2005). Beyond this, face-to-face feedback can be more sensitive to students' complex social and emotional responses to feedback (Cramp, 2011). Face-to-face feedback can offer sensitive discussion around areas for development in an environment where students feel safe to ask questions. However, providing relevant and appropriate nuanced face-to-face feedback can be a challenge. If not attended to, there is a danger that the existing power relationship between the tutor and student might reduce the potential for dialogue, resulting in the student taking a passive role. It has been found that even when opportunities for dialogue are offered e.g. to discuss the written feedback they had received, many students were too embarrassed or intimidated to ask for help, or choose not to for other reasons (Bloxham & Campbell, 2010). A critical component of face-to-face feedback appears to be providing the appropriate conditions for students to engage in dialogue with tutors.

Effects of Feedback Type on Academic Performance

Contemporary research has focused on written feedback in comparison to audio feedback and this has shown that academic performance is not significantly different when applying audio feedback in contrast to written feedback (Macgregor, Spiers, & Taylor, 2011; Chalmers, MacCallum, Mowat & Fulton, 2014; Voelkel & Mello, 2014; Morris & Chikwa, 2016). The majority of studies have found that students have a clear preference for audio feedback (Macgregor et al 2011; Voelkel & Mello, 2014; Heimbürger, 2018), with only one study reporting that students had a strong preference for written feedback (Morris & Chikwa, 2016). There is currently no research that has explored the impact of written feedback, audio feedback and face-to-face feedback on students' academic performance. Therefore, the aim of this study was to investigate the impact of these three types of feedback on the academic performance of level six undergraduate students. It was hypothesised that due to its dialogic nature, face-to-face feedback would prove superior in enhancing academic performance.

Method

The study was provided with ethical approval by the University Research Ethics Committee. Convenience sampling was applied within this study to recruit a total of 91 full-time third year (level six) physical education students (20-24 age bracket; male = 45, female = 46) from a University in the South of England. The participants were provided with a participant information sheet which detailed the procedures involved in the study and a follow up verbal briefing was conducted by the module tutor (first author). Participants were divided into one of three feedback groups (written n = 55, grade point average (GPA) 58.3%; audio n = 18, GPA 61.8%; or face-to-face n = 18, GPA 61.3%). The participants were not divided equally across the feedback groups due to logistical issues with timetabling participants for the face-to-face feedback and technical requirements for recording the audio feedback.

Participants studied a 13-week level six (year three) module that had two summative assessments (Assessment A and Assessment B). The participants were provided with the assessment criteria during the first week of the module. Assessment A was a presentation and was worth 30% of the overall module mark. For this presentation participants were asked to explore behaviour management strategies observed in schools and reflect on their successes drawing on relevant literature and personal experiences. This presentation was conducted six weeks after the start of the module. After the completion of the presentation, the module tutor provided all feedback through one of the three types. Written and Audio feedback and grade were released two weeks after submission whilst face-to-face feedback was delivered earlier in the second week. This timely response allowed students sufficient time to use the feedback. The feedback followed a consistent approach which highlighted the strengths of the presentation and areas for improvement. The feedback also referred to specific moments within the presentation allowing participants to match up the feedback comments with the detail of their work. The feedback comments were explicitly aligned to the assessment criteria and at least two feed forward comments were provided on how the student could improve their academic performance for Assessment B. All participants received their feedback within two weeks, leaving five weeks before handing in Assessment B.

The written feedback was provided via a module assessment feedback form and this was the standard feedback type that the participants normally received. The nature of the software meant that the grade and feedback would be released at the same time. The audio feedback was emailed as an individual MP3 audio file. The audio files were between 3 and 6 minutes in length, which provided sufficient time for the module tutor to apply appropriate comments. The assessment grade was provided at the end of the feedback. Face-to-face feedback was delivered in a quiet room within the university's learning resource centre to prevent distractions. Before the feedback began, participants were advised that the intention behind this feedback type was to encourage a two-way dialogue and that they could interrupt with questions or comments at any time. At the end of the feedback session, participants were once again asked if they had any final comments or questions to ask. These face-to-face feedback sessions lasted between 16 and 21 minutes. For all of the participants in the face-to-face and audio feedback groups, it was their first experience of receiving this type of feedback for a university assessment.

Assessment B was a seen essay examination worth 70% of the overall module mark. Whilst differences in the types of assessment (presentation and essay examination) are acknowledged, the participants were assessed according to the same assessment criteria for both Assessment A and Assessment B.

- *Critically evaluate the **behaviour for learning** (Assessment A) **assessment for learning** (Assessment B) strategies employed in the learning environment. In doing so be able to devise and sustain arguments in support of selected strategies.*
- *Critically and systematically explore research and policy relating to behaviour for learning (Assessment A) assessment for learning (Assessment B).*
- *Include relevant exemplars drawn from both literature and personal teaching experiences.*
- *Having critically evaluated the evidence, arguments and assumptions reach sound judgements and make suggestions for future practice.*
- *Construct and communicate arguments clearly.*

Both assessments required participants to draw examples from literature and personal experiences but the contexts of the assessments were different (Assessment A focusing on behaviour management and Assessment B focusing on pupil assessment). There was a clear intention by the module tutor to provide feedback following Assessment A that could be used by the participants to enhance their academic performance for Assessment B. This study is informed by Kolb's learning theory (Kolb, 2014). The intention was that the student would have a concrete experience (conduct a presentation for Assessment A) followed by a period of reflective observation (reflect on the presentation experience and the feedback provided). This would then stimulate abstract conceptualisation (new idea/s of how to improve academic performance) and then Assessment B would provide an opportunity for active experimentation (integration of new idea/s).

All of the assessments were moderated by the Head of Academic Department and two external examiners. The moderators were provided with video footage of the presentations, the audio files and the written feedback. No adjustments were made to the grading of the assessments and the external examiners commented that the quality of feedback was consistent across all of the feedback types.

Data was checked for normal distribution, and has been presented as the mean average ± standard deviation. To assess any possible difference in the impact on academic performance through written, audio, and face-to-face feedback, the average participant grade performance in feedback groups was compared using a two-way ANOVA (Assessment A – B X Feedback type). Post hoc comparisons were completed with t tests to enable comparisons to be made between the different types of feedback. Significance was accepted at $p < 0.05$.

Results

Initial analysis of the GPA for the year for each group did indeed reveal a significant difference ($F_{(2,89)} = 4.844$, $p = .01$). The written feedback group's GPA was 58.3%, which was significantly lower than the audio group's GPA of 61.8% and the face-to-face

group's GPA of 61.3%. There was no difference in the GPA of audio and face-to-face groups. The difference in the GPA of the written group and the other two groups may well indicate that the written feedback group was different at baseline.

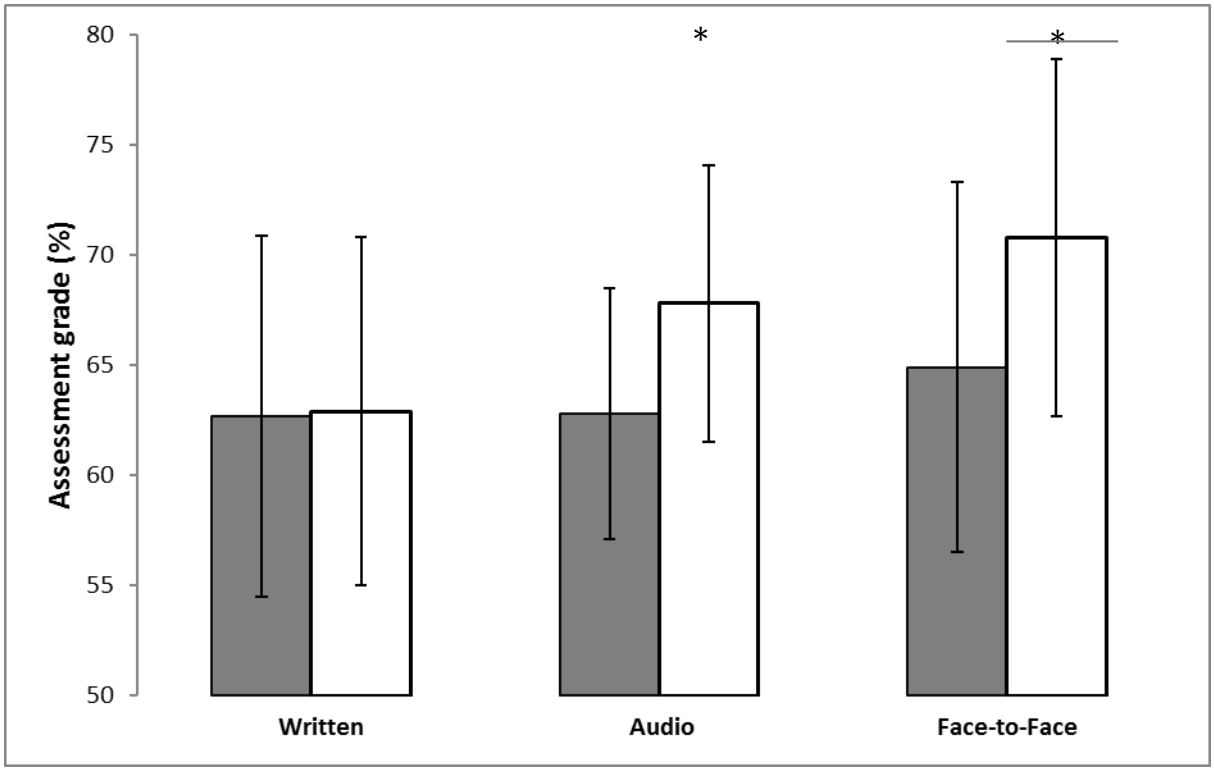

Figure 1. Assessment A percentage grade (closed bars), and Assessment B (open bars) following different feedback methods. * Denotes significant change from assessment A to B.

The analysis of the Assessment A grades (the baseline for this investigation) indicated no significant difference between the groups (written feedback = 62.7%, audio = 62.8 % and face-to-face = 64.9%) (see Figure 1). In addition, a correlation was completed between the two assessment grades, which indicated a statistically significant positive correlation (r= .543, $p < 0.005$), as one would expect from a typical student sample.

The effect of the feedback type on assessment grade is shown in Figure 1. The results of the two-way ANOVA showed a significant effect on the assessment grade ($F_{(1,89)} = 17.993$, $p < .005$), in that, Assessment B's grade was higher: 67.2% versus 63.5%. There was also a significant effect of the feedback type ($F_{(2,89)} = 5.766$, $p = .004$). Post

hoc analysis suggests that feedback in the written form for the first assessment had less effect on the subsequent assessment grade; from 62.7% to 62.9%. However, both audio feedback and face-to-face feedback led to a significant improvement in the grades; from 62.8% to 67.8%, and from 64.9% to 70.8%, respectively.

Discussion

The aim of this study was to investigate the impact of written, audio and face-to-face feedback on the academic performance of level six undergraduate students. The results indicated that written feedback for Assessment A had less effect on the subsequent assessment grade for Assessment B. However, both audio feedback and face-to-face feedback led to a significant improvement in academic performance. There was very little difference in the grade improvement between the audio and face-to-face feedback, therefore it appears that either of these feedback types may be useful in enhancing academic performance. The hypothesis can not be fully supported as both face-to-face and audio feedback helped to enhance academic performance and therefore face-to-face feedback was not considered to be superior.

The majority of previous research has found no significant difference in academic performance when audio feedback has been compared to written feedback (Macgregor et al., 2011; Chalmers, et al., 2014; Voelkel & Mello, 2014; Morris & Chikwa, 2016). However, the current study did find a significant difference in support of audio feedback and one potential reason for this finding could be that the audio feedback provides a richer experience and allows the opportunity for a tutor to offer greater detail within the feedback (King, McGugan & Bunyan, 2008). This may enable a student to successfully utilise the audio feedback and enhance their subsequent academic performance. A further potential reason for this finding could be related to the level of student engagement with the written feedback. As a tutor, we make the assumption that comments are read by students and acted upon, and yet, previous research looking at written feedback has suggested that some students only pay attention to the allocated grade (Timmers & Veldkamp, 2011). In contrast, the success of audio and face-to-face

feedback be partially explained by a higher level of student engagement with the feedback. This was the first time that any of the participants had received feedback in any other way than written format for a university assessment, and for this reason, it is possible that the novelty factor facilitated engagement. It is also important to recognise that there was no option to withhold the assessment grade for the written feedback, however, for the audio feedback and face-to-face feedback this was presented verbally at the end. A potential issue could be that students within the written feedback group did not read the feedback provided and just looked for the assessment grade. However, for the face-to-face and audio feedback groups, the participants were more likely to have listened to all of the feedback provided (Merry & Orsmond, 2008) and therefore would have had a greater opportunity to analyse the feedback more carefully (Jackson & Marks, 2016). One further point to raise is that the participants within the written feedback group had a GPA at baseline that was significantly lower than the participants within the audio and face-to-face feedback groups. It could be argued that these participants may find it generally more difficult to interpret and utilise feedback.

The less formal and, perhaps, less unambiguous nature of face-to-face and audio feedback may have also made it easier to interpret and apply. Making sense of feedback requires students to recognise and interpret the language used (Castle, Incledon & Waring, 2008). When writing feedback, tutors often attempt to match the feedback language with the generic marking criteria to justify the grade awarded. This is a practical approach as long as the language used is accessible and does not alienate the learner with jargon (Sadler, 2010). A phrase that appears on the generic marking criteria is ‘critical evaluation’. On reflection, the module tutor felt that providing feedback on how a participant applied critical evaluation within Assessment A was much more efficient and effective through verbal communication rather than written communication. Audio and face-to-face feedback may enable the tutor to simplify difficult concepts in a way that all students can understand.

It was hypothesised that face-to-face feedback would have the most positive impact on academic performance compared to written and audio feedback, however this was not supported. Although face-to-face feedback did improve academic performance it performed similarly to the audio feedback. This is perhaps not surprising with many

common qualities including more volume and depth of feedback in a language the student can understand (King, McGugan & Bunyan, 2008). In addition, they both offer a more personalised approach to feedback. A further implication of this finding is that audio feedback may have the potential to offer a more efficient way for tutors to deliver feedback (Emery & Alkinson, 2009) as the duration of the audio feedback was 3-6 minutes whereas for face-to-face feedback it was 16-21 minutes. However, caution is required when interpreting this finding as this only details the duration of the feedback delivery session and does not take into account the time spent preparing for the feedback session.

In order for face-to-face feedback to be at its most effective, it should be rich in two way communication exchanges (Nash et al, n.d). This was not always achieved, as the module tutor experienced a number of occasions where the participants acted as passive recipients and would not comment on the feedback provided. This resulted in some instances where the feedback was essentially delivered as a monologue. To overcome this, students need to be educated as to the value of their role in the process of face-to-face feedback. If the expectations of the assessment are made clearer, they will be better equipped to self-evaluate, hopefully leading to effective assessment discussions with their tutor.

It is important to recognise the influence of the timing of feedback within the current study. The feedback was very carefully developed to feed forward into the next assessment (for all feedback types). All participants received their feedback within two weeks allowing them time to process the emotions of their feedback as well as sufficient time to use it (Evans, 2016) before the next assessment point five weeks later. However, a limitation of the research design was that some of the face-to-face group received their feedback up to five days earlier than the audio and written feedback groups, to overcome this inequality face-to-face feedback would need to be delivered on the same day.

Accurate measurement of feedback effectiveness is extremely difficult. Whilst attainment informs us of impact on student performance, it provides little information on

how the feedback comments actually led to improvements in academic performance. To make recommendations for future policy and practice, we need to fully understand why audio and face-to-face feedback was more effective than written feedback. It could be argued that the students themselves might be the best judges of feedback effectiveness and therefore future investigations should consider student perceptions of the impact of different feedback types.

The current study suggests that audio feedback and face-to-face feedback could have a positive impact on academic performance. However, it should be recognised that a number of factors could have influenced the enhancement in subsequent assessment grades. The mode of assessment was different for Assessment B and this may have been a preferable assessment for those students in the audio and face-to-face feedback groups. Also, the motivation and desire of an individual to reflect on their feedback and to formulate new ideas of how to improve their academic performance could have impacted the assessment grade achieved in Assessment B.

Conclusions

The purpose of this study was to investigate the impact of written, audio and face-to-face feedback on the academic performance of level six undergraduate students. Given this was a small scale study, conclusions remain tentative; however, they do suggest that audio and face-to face feedback may prove superior to written feedback. Audio and face-to-face feedback have the potential to better engage students and support learning by offering richer and clearer feedback. There is a need for future studies to explore how students perceive the feedback and utilise it to enhance their academic performance.

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