Assessment and Feedback: The views held by Y12 pupils of teacher feedback following summative assessment

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ASSESSMENT AND FEEDBACK: THE VIEWS HELD BY Y12 PUPILS OF TEACHER FEEDBACK FOLLOWING SUMMATIVE ASSESSMENT

Research and Development Project submitted to the University of Oxford for MSc in Learning and Teaching

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Abstract

As a head of department at a highly academic independent school I had sought to improve pupil monitoring through the use of regular low-stakes summative assessments in class. This had generated useful data for teachers but I was conscious that students could be more engaged with the formative nature of these assessments. This collaborative intervention was therefore conducted with a focus on how to develop formative assessment processes out of informal summative assessment.

The literature review suggests summative assessment can be used formatively and that this can be achieved through feedback. The feedback must be used formatively and literature stated that summative assessment could be used in this manner provided feedback was acted upon by students and teachers. There were differing opinions in literature as to which feedback method is the most effective, with studies making use of such methods as comment-only, verbal, peer and self-assessment. The following research questions were chosen to explore the value of feedback following summative assessment:

1. How do students perceive the feedback they currently receive following in-class summative assessment?
2. What are students' views when different methods of feedback are employed?
3. How can teacher feedback be improved?

Three methods, which were different to the normal feedback delivery method, were trialled with students. Two physics teachers, from the same school, participated in this research along with 17 students from two classes of which they share the teaching. Students completed questionnaires before any new feedback methods were trialled, after each new method and after all three methods had been trialled.

It was found that students responses were already very positive about the feedback they were normally receiving in their lessons. Following the trialled methods of feedback, it was evident that students preferred verbal feedback to comment only, or self-assessment. Comment only marking was the least well received with many students unhappy about the removal of grades from their work. Following the three trialled methods the majority of students indicated that they would prefer a mixed methods approach to the feedback they receive in future, making use of self-assessment, comment only and verbal feedback.

Summative assessment can be employed in a formative context, but this can sit difficultly against high-stakes summative assessments that are placed at the forefront of educational achievement. Students have mixed opinions about what works best in helping to progress their learning towards their desired goal and as such not every feedback method will work for all students, meaning teachers need to plan for the use of multiple methods in their teacher scheme. This project will form the basis for departmental discussion and collaboration on how best to improve the reflective skills of our students and implement formative assessment processes out of informal summative assessments. These processes should be ultimately empowering students to take ownership and responsibility for their own learning and develop them as self-reflective learners.

Introduction

School Context

I am Head of Physics at an independent secondary school located in the Midlands, United Kingdom. The school is a single sex all-boys school, with a population of approximately 850 from the ages of 11 – 18. In years 7 to 9, an in-house curriculum (based on the National Curriculum) is delivered with GCSEs or iGCSEs sat in year 11 and the International Baccalaureate Diploma sat in year 13. Competition for places in year 7 is high, with several hundred boys sitting the entrance exam for the 120 places available in a year group. As a result the academic standard of the school is extremely high, as is demonstrated by results in external examinations. In 2019 over 67% of grades awarded at GCSE/iGCSE were grade 9/8/A* and for the International Baccalaureate the average points score was 37.9, some 8 points above the world average.

At the end of each school year there are internal exams for years 7 to 10 and 12. The data from these exams is used to monitor the relative performance of pupils across their time at the school, as well as for setting in some subjects. Due to the competitive nature of the students and parents within the school, students are not told their position within the year group but rather ranked in 'bands'. Approximately the top third of the year group is placed in band 1, the next third in band 2 and so on. This is to reduce comparison between pupils but still give parents and students an idea of how their performance compares with their peers. Alongside these end of year exams, sitting tests in class throughout the year is the norm in most subjects. This data provides insight on academic performance throughout the school year and helps teachers with pupil tracking and provides data for report writing.

Personal Context

Upon becoming Head of Physics I realised the department's pupil monitoring and tracking needed improvement. As a result, I introduced regular topic tests across all year groups, a system that had been successfully used in my previous two schools.

These were intended as low-stakes assessments to allow students to become more familiar with exam style questions, as well as providing regular data to the class teacher. However, I had not anticipated how competitive the students would be and their concerns about what these tests would count towards. There were repeated questions from students in all my classes as to what the assessment was for and would it be used as part of their end of year grade. Once assessments were returned, I was surprised about how quickly and how vocally many students would be comparing their grades, trying to find out who was top and bottom of the class. It took several months before the students realised that these assessments did not form part of their end of year grade and that they were not reported to their tutor or parents unless there were serious concerns.

Following my shock at how concerned the students were over how the data from their assessments would be used, I realised that more importance was being placed on the grade than future learning. I do not want to remove the assessments as they provide important exposure for the students with regards to memory recall and working under a time constraint. However, I want to improve the reflective skills of students and the progress they make from sitting these assessments.

One element of these topic tests that I know can be improved, having delivered them for several years in other teaching roles, is the feedback that the student receives following the assessment. I believe the students understand the importance of the process of feedback, but I think that the feedback can be delivered in a manner that is more beneficial to the students' ongoing learning and development within the subject. It is this that I intend to investigate, first by

looking at the literature surrounding feedback and assessment and then by trying different approaches to feedback with my students to understand their opinions of these methods.

The International Baccalaureate Diploma Programme

As my research will focus on students in Year 12, I will first explain the International Baccalaureate Diploma Programme (referred to as the IB) that the students in my research are studying. The school has been offering this educational programme for 10 years and is one of only a few schools in the UK to offer this as the sole educational programme post-16; no A-levels are offered. The website for the International Baccalaureate outlines the Diploma Programme as follows:

> Through the DP, schools are able to develop students who:
>
> - have excellent breadth and depth of knowledge
> - flourish physically, intellectually, emotionally and ethically
> - study at least two languages
> - excel in traditional academic subjects
> - explore the nature of knowledge through the programme's unique theory of knowledge course
>
> (International Baccalaureate, n.d.)

To complete the IB Diploma a student studies six subjects English, Maths, a science, a language, a humanities subject, and an arts subject or a second science / language / humanities subject. Of these six subjects, three are studied at Higher Level (HL) and three are studied at Standard Level (SL). Alongside these six subjects, students also complete a core element covering Theory of Knowledge, an Extended Essay on a subject of their choosing and the Creativity, Action and Service programme, recognising extra-curricular activity.

Subjects in the Diploma Programme are graded on a points-based system where 7 is the maximum number of points available in a subject and 1 is the lowest. The core element of the programme is graded out of a maximum of 3 points. On the culmination of their studies students are given a score out of a maximum of 45 points and universities will give offers based on the total points score and points achieved in the individual Higher-Level Subjects. This need to achieve a

desired point score to progress on to the university degree of their choice has a direct impact on the competitive nature of the students and their focus on achieving the highest grades in all assessment scenarios, even low-stakes class tests.

Literature Review

There is considerable research on assessment, be it the different forms assessment can take to its implementation in the classroom. However, there is still disagreement on the most appropriate method of feedback and how best to implement this in the classroom. The purpose of this literature review is to draw on a variety of types of literature to summarise the use of summative assessment, its formative applications and feedback in the classroom. Then, via analysis of previous research studies, I wish to identify different methods of delivering feedback to students following a summative assessment with which they will engage.

Introducing Assessment

As a term within education, assessment is ill defined, and the terms 'assessment', 'examinations' and 'tests' are often used interchangeably (Stobart, 2008). Each educational setting will have its own interpretation of when and how these terms are used, but Stobart (2008) identified 'assessment' as being evidence gathering from a range of approaches, an 'examination' as an exercise completed under standardised conditions involving written responses, whereas and a 'test' could utilise elements such as multiple-choice questions. This interchangeable nature does not make the job of a teacher any easier when it comes to delivering effective assessment to their students.

According to Cambridge University Press (2020), assessment is defined, in their English dictionary, as 'the act of judging or deciding the amount, value, quality, or importance of something…'. Assessment within the educational context has been defined as 'the process of

gathering, interpreting, recording, and using information about students' responses to educational tasks' (Lambert & Lines, 2000). Both these definitions share the common theme that a comparison is made between the work completed, by the student in this case, against a predetermined scale or outcome. However, the dictionary definition has a greater emphasis on judgment and importance, something that is not shared by the definition from Lambert and Lines (2000). The sliding scale of assessment activities can range from day-to-day teaching, whereby a teacher asks a student a question, to the 'high-stakes' external examinations sat by students at age 16 and 18 in the United Kingdom.

The origin of the external written examinations that many associate with 'assessment' was within the elite universities. These universities wished to test the boys wanting to study with them and this idea of assessment filtered through to secondary schools and still influences education to this day (Stobart, 2008). Furthermore, Stobart (2008) identifies some key historical roles for assessment, beyond identifying academic ability, and describes its purposes as follows:

> … establishing authenticity in pre-scientific times; certificating occupational competence through the guilds and professions; identifying learners in need of special schooling or provision; and as an accountability tool to judge the effectiveness of institutions. (p.13)

Teachers spend a considerable amount of their time in assessment related activities (Butt & Lance, 2005). In a national survey of teacher workload, Butt and Lance (2005) found that teachers spend approximately 22% of their time each week on MARRA activities (monitoring, assessment, recording, reporting and accountability). They also reported that MARRA activities were one of the main contributors to teachers' excessive workloads, with teachers feeling that they lacked sufficient time to complete these activities. It is no surprise that some teachers have a negative attitude towards assessment and that students can be dismissive of it. Teachers can generate a significant amount of data about their students but without the time to do something with this information it is not being used to advance student learning or inform their own teaching (Butt, 2010). Teachers need to be clear on the purpose of the assessment they are using, the

intended outcomes and whether these can be successfully achieved (Butt 2005). We should all be asking the question: what is assessment for? In 2008, Wiliam gave an overview of the many purposes for which assessment is used:

> It is through assessment that we can find out whether students have learned what they have been taught, so that we can make appropriate adjustments to our teaching. Assessments are used to describe the achievements of students, so that decisions can be made about their suitability for particular jobs, or the kinds of educational experiences that should follow. Parents use the results of assessments to learn about the progress their children are making at school, and to make decisions about the quality of education offered in different schools. And, of course, policymakers use assessments to provide information about the quality of schools and curricula. (p. 123)

This quote highlights the many reasons that assessment is used in schools. In one assessment task a teacher may be seeking to provide the teacher and student with information on their progress, but also informing parents, who may be less educated in how assessment in school operates. This can lead to confusion as to the purpose of the task and confusion or misunderstanding in the interpretation of the outcomes.

Assessment is seeking to satisfy several different roles; formative, summative, certification, and evaluative (Butt, 2010) and for practising teachers' understanding each of these roles and if they can be successfully combined, is very important (Stobart, 2008). The impact of assessment on students can have multiple outcomes. Students may be encouraged by the assessment they have undertaken; they may be demotivated or have no reaction at all. This motivation or demotivation is often a result of what happens after the assessment with the feedback or results that the student receives. There can be a tendency to overstate the importance of grading and under-emphasise the importance of the learning taking place (Butt 2010). This can lead to the superficial setting of targets related to grades, distorting the effect on the teaching and learning that takes place, resulting in students and teachers both 'playing the system' (Stobart, 2008).

A large amount of assessment activity involves teachers making comments on written work produced by students, with students often compared to each other, which can be demotivating for them (Butt, 2010). This can result in students not becoming independent in their learning and being unable to identify their own strengths and weakness, relying heavily on teacher input to present the path to improvement and lacking the ability to determine this path for themselves (Weeden et al., 2002). In 2010, Graham Butt referred to the Qualifications and Curriculum Authority (QCA)-funded LEARN project and its findings in the late 1990s that 'many students remain unclear about what they are learning, why they are learning it and how this learning will be assessed' (p. 7) agreeing with the work of Weeden at al. (2002).

A prominent paper that reviewed published research on teacher assessment (Black and Wiliam, 1998a), concluded that the learning of students responded most positively to the regular use of formative assessment. Equally important was the opportunity and ability of students to reflect honestly on their own academic performance and visualise the steps that need to be taken for them to improve their own performance.

From the literature, it can be seen that assessment is a term fulfilling many roles and is often confused with other terms within education (Stobart, 2008). At its core, it involves a comparison between student work and a pre-determined scale or criteria and can take the form of day-to-day activities in lessons or external high-stakes testing such as GCSEs or A-Levels. Either way, teachers spend a considerable time on assessment activities (Butt & Lance, 2005) with summative assessments forming a prominent part of this due to their significance in the UK education system. However, what do we mean by summative assessment and how does current literature present its use in school?

The Use of Summative Assessment

In A Dictionary of Education (Wallace, 2009) summative assessment is defined as 'assessment which takes place at the end of a course of study and provides final judgment on…the candidate's performance'. This definition is corroborated by Moss (2013) who describes summative assessment as a tool for assessing the overall achievement of a student at a given time for a specific area of learning.

Summative assessment is most commonly associated with the external assessments students sit at different stages of their school career; age 16 and 18 in the United Kingdom. These assessments can have significant impact on a student's future, as the grades are often used to decide suitability for future courses and acceptance into Higher Education institutions. These external assessments are well funded, well researched and infrequent in the school life of a student; they are most often exposed to summative assessment experiences within the classroom (Brookhart & Durkin, 2003). External high stakes summative assessments can have a profound impact on a student's understanding of the connections between assessment and learning (Butt, 2010) but their importance is driving an increased use of summative assessment within classroom assessment practices (Moss, 2013; Clarke et al., 2000).

An issue with the increased use of assessments within the classroom is the competency of teachers to design, deliver and interpret the data that they generate. Teachers often mistakenly assume that their professional experience and educational training makes them fully equipped to deliver effective summative assessment in the classroom (Gullikson, 1984; Wise et al., 1991). Teachers are using a variety of assessment techniques with inadequate training on how to effectively design and implement these assessment methods (Hills, 1991; Moss, 2013).

There is a lack of instruction to teachers during their training and as part of continuing professional development on how to design, deliver and interpret a variety of effective

assessment techniques, this has been well documented in literature on classroom assessment (Goslin, 1967; O'Sullivan & Chalnick, 1991; Roeder, 1972). This lack of training results in teachers regularly including factors unrelated to achievement, such as effort, behaviour or perceived motivation, in their summative assessments meaning they will calculate grades without consideration for the relative importance of different assessments across a period of teaching (Griswold, 1993; Hills, 1991; Stiggins et al., 1989).

In contrast, the view of classroom assessment literature on the ability of teachers' to accurately summarise student achievement is split. In some cases, literature paints a sceptical view of the ability of teachers to be accurate judges of student achievement. This was blamed on teacher judgment becoming clouded by traits such as motivation, engagement, and perceived motivation that do not represent student achievement (Gittman & Koster, 1999; Sharpley & Edgar, 1986). Counter arguments to this claim are that teachers are the best source of information on student achievement and that an effective teacher can have a rich understanding of their students from the significant time they spend with them and the many experiences they have together (Baker et al., 1991; Kenny & Chekaluk, 1993; Meisels et al., 2001).

Teachers will regularly make use of summative classroom assessments to evaluate the effectiveness of the teaching they have delivered alongside the progress of their students (Moss, 2013). These judgments are then used in the school context to guide such activities as setting, reporting, arranging additional support and communicating with parents (Gittman & Koster, 1999; Sharpley & Edgar, 1986). Teachers are delivering an increased number of these assessments and are willing to adapt their teaching based on the results of both internal and external assessment results (McMillan, 2005). However, teachers also accept that their views of what good classroom assessment should be and what they are delivering does not match (Black et al., 2010; McMillan & Nash, 2000; Rieg, 2007). In some instances, teachers undermine the data from summative tests through teaching questions that are on the test and giving hints or extra time (Hall & Kleine, 1992;

Nolen et al., 1992) which compromises how effective these tests are at evaluating student achievement (Moss, 2013).

The assessments that teachers deliver and the judgements that they make in the classroom setting can have a significant impact on a student's motivation, future learning, study patterns, effort and self-perceptions (Black & Wiliam, 1998a; Brookhart, 1997; Rodriguez, 2004). Some assessments may give students a sense of success and achievement, whilst others can demoralise, leaving students feeling a failure (Moss, 2013). The way in which a teacher uses an assessment and the emphasis that they place on the outcome can have a significant impact on whether students become learning or goal orientated (Harlen, 2004). As students are most exposed to assessment events within the classroom the teacher tells the student, through the use of these assessments, what is valued and has a significant impact on student motivational factors, like self-efficacy, self-regulation, and achievement goals (Ames, 1992; Brookhart, 1997; Brookhart & Durkin, 2003; Harlen & Crick, 2003).

When grading is regularly the primary focus of classroom assessment this will orientate students towards valuing performance goals ahead of learning goals in their future assessment activities, with motivation decreased and learning harmed when the grades are used to reward or praise (Harlen, 2004). Teachers are aware of the 'detrimental effects of classroom assessments that emphasize the importance of grades rather than learning and on public rather than private evaluation and recognition practices in student achievement motivation' (Alkharusi, 2008: 262).

Students themselves feel that the assessments and assessment strategies that they are exposed to during their school career are rarely helpful to them (Rieg, 2007). Within his work Rieg (2007) notes that there are several strategies students would find more helpful, such as being given checklists prior to assessments, time in class to prepare or a study guide to review the material to be included in the test.

Despite this negative outlook in literature on the competencies of teachers to deliver effective feedback and the feeling of students that it is often unhelpful to them, 'good summative assessment is important to our educational system' (Butt, 2010: 53). Summative assessments delivered by teachers in the classroom setting do have the potential to positively influence students (McMillan, 2003) as they do not carry the negative effects associated with large scale 'high-stakes' external assessments and can provide a more all-round picture of a student and their achievement (Martinez et al., 2009).

The positive impact of teacher delivered summative assessment lies in the feedback given to the student, meaning it is being used formatively. When the feedback from an assessment is effective it can increase a student's motivation to learn. Effective feedback is related to the task and learning of the student instead of centring on performance goals, such as grades (Harlen & Crick, 2002). Most classroom assessments are used internally within a school, for example in reporting and communication with parents, and are more motivating to a student when the feedback does not pass judgment (Harlen, 2004). Older students often respond more positively to summative assessment activities, learning from these teacher assessments, and finding them motivating. Using assessment practices that encourage students to think more deeply is more beneficial to teachers and encourages them to change their teaching habits, exposing students to a wider range of learning experiences (Harlen, 2004).

Teachers can improve the assessment that they deliver by being mindful of the feedback they provide, the emphasis they place on grading and learning goals and by working together collaboratively to engage in training and reflection of their assessment practices (Atkin & Coffey, 2001; Black et al., 2010; Black & Wiliam, 1998a; Goldberg & Roswell, 2000; Sato, 2003; Wilson, 2004; Wilson & Sloane, 2000).

Summative assessment is unique among assessment activities (Harlen, 2004) but often most prominent in the minds of both teachers and students due to the impact of high-stakes

external assessments (Brookhart & Durkin, 2003). Despite this, it is in the classroom that most summative assessment is encountered, and teachers are aware that that they are not always delivering assessments that follow best practice (Black et al., 2010; Rieg, 2007). These summative assessments can impact upon students' future learning, effort, and self-perceptions (Black & Wiliam, 1998a; Brookhart, 2010) and this impact can be positive if the feedback from these assessments is delivered effectively (Harlen & Crick, 2002). The role of feedback is closely linked with the idea of formative assessment, particularly thanks to the work of Black and Wiliam, but how does summative assessment fit with the ideals of formative assessment?

Summative Assessment as Formative Assessment

Summative assessment is often considered by teachers, students, and researchers to be a separate entity to formative assessment. Formative assessment, its characteristics and implementation, has been a major part of the research conducted by Black and Wiliam over recent years. In 1998, they defined formative assessment as 'encompassing all those activities undertaken by teachers, and/or by their students which provide information to be used as feedback to modify their teaching and learning activities in which they are engaged' (Black & Wiliam, 1998a: 7). The pair further updated this definition in 2009:

> Practice in a classroom is formative to the extent that there is evidence about student achievement is elicited, interpreted, and used by teachers, learners or their peers, to make decisions about the next steps in instruction that are likely to be better founded, than the decisions they would have taken in the absence of the evidence that was elicited.
>
> (Black & Wiliam, 2009: 9)

This updated definition places emphasis on the gathering of data/information and that this is used to inform future decisions on teaching and learning practice for either the student or the teacher. It is indicated that the changes made, when related to teaching and learning, will be for the better if they are based on evidence gained from formative assessment rather than changes made without this evidence.

Despite the large body of work on the importance of formative assessment, not all authors agree with Black and Wiliam on the definition of formative assessment (Dunn & Mulvenon, 2009; Nicol & Macfarlane-Dick, 2006; Popham, 2008). An alternative definition is provided by Vogelzang and Admiraal (2017) who say formative assessment is 'a process in which students discuss and debate about questions concerning the subject and concepts they are studying' (p. 157). Despite these differing opinions on the definition, I did not find a disagreement between authors on the idea that formative assessment is a positive tool in the classroom.

The disconnection between summative and formative assessment could be attributed to the high-profile position within education of external summative assessments that deliver grades without feedback to students and have significant impact on their future learning pathway. Some believe that formative and summative assessment within schools should be kept separate so that the process of formative assessment is not polluted by the negative aspects of summative assessment (Torrance & Pryor, 1998). However, in practice teachers cannot keep summative and formative assessment practices isolated from one another, but rather need to have both work side by side (Black et al., 2003). In fact, summative assessment can be used in a formative manner providing evidence is gathered, interpreted, and then used to inform and improve teaching and learning (Black et al., 2003; Kennedy et al., 2008; Wiliam, 2011).

Whilst summative assessment can yield a large amount of data and evidence about a learner if this information is not acted upon the assessment has not been used in a formative manner (Dunn & Mulvenon, 2009; Swaffield, 2011). The evidence from summative assessment must be used to reduce the gap between students' current performance and desired achievement, giving guidance and encouraging the learner, otherwise it was not an effective formative exercise (Wiliam, 2011). Another key factor in the effectiveness of formative assessment is the engagement of the learner. Students need to be active participants in their own learning and must be engaged with the formative aspect of an assessment for it to be useful and

successful (Elwood & Murphy, 2015; Wiliam, 2011), without the student engaging in the process it is not truly formative assessment (Assessment Reform Group, 1999).

A suggestion for how to use summative assessments formatively was presented by Black et al. (2010).

> …use the aftermath of tests as an opportunity for formative work. Teachers might, for example, look to see which questions were poorly done by most students and concentrate on rectifying the learning associated with those, rather than simply working through a mark scheme where the focus is on claiming a few extra marks rather than on focusing on learning. Peer marking of test papers can also be helpful, as with normal written work, and is particularly useful if students are required first to formulate a mark scheme, an exercise which focuses attention on criteria of quality relevant to their productions…
>
> (p. 55).

The views expressed by Black et al. (2010) challenges the opinion of Torrance and Pryor (1998) that formative and summative assessment should remain separate practices within schools. It is unrealistic to have teachers and students maintaining such separation between these two tasks when both present positive learning opportunities if used correctly. Rather we must seek 'a more positive relationship between the two' (Black et al., 2010: 55).

There are challenges to the implementation of formative assessment within the wider school context, despite the positive attitude towards it presented by research. This is highlighted within the research carried out into formative assessment. Dunn and Mulvernon (2009) reviewed the research of Black and Wiliam (1998a) along with nine other more recent studies. They highlighted issues with the methodology surrounding the studies of formative assessment and that few of these studies had been conducted within a traditional classroom setting. Several other reviews have been carried out and highlight formative assessment studies having very small sample sizes and teachers receiving significant support from researchers, leading to scepticism over the wider implementation of the formative assessment methods (Black et al., 2002; Torrance & Pryor, 2001; Vogelzang & Admiraal, 2017).

A trial of a method for the implementation of assessment for learning yielded positive responses from both students and teachers in a large-scale study involving five schools, although there was a noted increase in teacher workload (Jonsson et al., 2015). Another smaller study looking at the effectiveness of formative assessment identified that formative assessment had a positive impact on student grades and that timely feedback was very important to this effect (Vogelzang & Admiraal, 2017). The importance of timely feedback was further corroborated by the work of Heitnik et al. (2016)

The increased workload noted in the study by Jonsson et al. (2015) is a difficulty faced by teachers in adopting formative assessment methods. Teachers need time to develop domain understanding, since if they do not understand the principles that underpin formative assessment then its success is less likely (Harlen, 2009). Alongside developing their domain-understanding teachers also need time to develop resources, a significant concern highlighted by many teachers involved in formative assessment studies (Beesley, 2018; Bennett, 2011, Jonsson et al., 2015). There may be significant changes required to classroom teaching practices for effective formative assessment (Black, 2015; Torrance & Pryor, 2001) and without adequate knowledge and skills teachers will be unable to question effectively, interpret evidence or be able to successfully modify their teaching in response to this evidence (Bennett, 2011; Black et al., 2003; Heitink et al., 2016). A gradual implementation of formative assessment practices is more likely to be effective than a superficial one (Black et al., 2002) and unsuccessful formative assessment is often due to poor implementation (Heitnik et al., 2016).

There is literature to support the idea that 'summative tests should be, and should be seen to be, a positive part of the learning process' (Black et al., 2010: 56) and that they can be implemented in a formative manner allowing improvement to teaching and learning. Whilst there are some challenges to overcome in large-scale implementation the 'active involvement of students in the test process can help them to see that they can be beneficiaries rather than victims

of testing, because tests can help them improve their learning' (Black et al., 2010: 56). An important part of the formative nature of summative assessments is in the feedback that is delivered and the involvement of students in this (Black et al., 2010).

Feedback in the Classroom

As seen from previously reviewed literature, feedback is the element of summative assessment that can make it formative (Black et al., 2010). This feedback can have a large impact upon a student's motivation and future learning (Black & Wiliam, 1998a; Brookhart, 2004) but is a broad term that encompasses several different classroom activities. In this section, I will define what the term 'feedback' means and how research suggests it should be effectively used in the classroom before reviewing different methods of delivering feedback, along with studies that have assessed their implementation.

Feedback can take many forms within the classroom, from short verbal interactions between a teacher and a student, to written comments provided by the teacher on work submitted by a student. Feedback is a process of communication between student and teacher that allows opportunity for the student to progress from where they currently are to where they could ultimately be (Black & Wiliam, 1998a; Leahy et al. 2005).

Feedback can be defined as 'information given to the learner and/or teacher about the learner's performance relative to learning goals or outcomes' (Education Endowment Foundation, 2018: 3). This definition shares many similarities to one given by Black and Wiliam (1998b) who described feedback as:

> …all those activities undertaken by teachers, and by their students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. (p. 2)

Feedback should 'aim to (and be capable of) producing improvement in students' learning. Feedback redirects or refocuses either the teacher's or the learner's actions to achieve a goal, by aligning effort and activity with an outcome' (Education Endowment Foundation, 2018: 1). It is monitoring strengths and weaknesses and should help students become more independent and rely less on the teacher providing direction on how to improve (Sadler, 1989). This idea was corroborated by research conducted by Black and Harrison (2001), in which they interviewed teachers and noted a shift in responsibility from the teacher to the student following the successful use of feedback.

In his influential work on formative assessment and the design of instructional systems, Sadler (1989) highlighted that feedback can close the 'gap' between students' current attainment and where they could or should be and that it is 'information about how successfully something has been done or is being done' (p. 120). In my search of the literature, I found no opinions against the idea that feedback in the classroom is important.

Despite this seemingly unanimous opinion that feedback is an integral part of the education process there are numerous schools that report they are not using feedback as frequently as they should be (Marsh, 2006). I can support this observation based on my own personal experiences in the classroom. Marsh (2006) suggested that the lack of focus on feedback might be due to teachers feeling pressure to achieve certain standards relating to testing and grades that may be applied by the school or the wider educational setting. However, it is not clear in the article how Marsh came to this conclusion that feedback does not feature as prominently as it should in the classroom. Agreement with the suggestion that feedback does not feature as frequently as it should come from Ramaprasad (1983) and Laws (2013). This is despite the importance of feedback as denoted within literature. Due to the frequency of feedback being low, it is important that the feedback strategies used are effective to encourage its further use and assist with closing the gap for students (Laws, 2013; Ramaprasad, 1983).

As I work in an independent school, the Independent Schools Inspectorate (ISI) who base their assessment criteria on The Education (Independent School Standards) Regulations (2014) assesses us. Within these regulations, there is only one brief mention of assessment and feedback related to the quality of education provided.

> The standard in this paragraph is met if the proprietor ensures that the teaching at the school…demonstrates that a framework is in place to assess pupils' work regularly and thoroughly and use information from that assessment to plan teaching so that pupils can progress… (The Education (Independent School Standards) Regulations, 2014).

This statement provides no guidance on best practice in relation to the assessment of pupils' work or the most effective methods for assessing and providing feedback. A similar statement is provided by Ofsted (2018), the body responsible for state school inspections.

> Ofsted recognises that marking and feedback to pupils, both written and oral, are important aspects of assessment. However, Ofsted does not expect to see any specific frequency, type or volume of marking and feedback; these are for the school to decide through its assessment policy (p. 2).

This generic statement meant that teachers were left guessing as to what Ofsted was expecting to see, which could lead to rumours regarding the expectations. However, Ofsted are clear that there needs to be a school policy but did not wish to set the benchmark themselves. There are a wide variety of publications that give examples of how to effectively mark students' work and deliver meaningful feedback (Black & Wiliam, 1998; Hattie & Timperley, 2007; Nicol & Macfarlane-Dick, 2006; Sadler, 1989). In their work Hattie and Timperley (2007) state that 'feedback aimed to move students from task to progressing to regulation is the most effective' (p. 91) and Leahy et al. (2005), comment that for feedback to be effective it needs to cause the student to think. From a review of the literature, it is evident that there are multiple methods for delivering effective feedback (Purcell, 2017) and that there is also a lack of evidence from research as to which marking strategies are the most effective in the classroom (Education Endowment Foundation, 2016).

This lack of evidence does not mean that there is no research on which methods of feedback may prove the most effective. In 2006, Nicol and Macfarlane-Dick conducted a literature review, looking at the principles of good feedback. The literature showed that it was important for teachers to be providing written feedback to students. This is because teachers are still considered the experts and have a deeper understanding of common misconceptions and the success criteria. However, this knowledge of the success criteria should be passed to students so that they understand what they are working towards. In the written feedback that teachers provide they should be corrective and prioritise areas for improvement, whilst keeping the feedback brief. Nicol and Macfarlane-Dick also suggested that teachers could seek the opinion of their students as to which type of feedback they preferred on their work.

One aspect of the feedback delivered to students that appears more frequently in literature is the use of grades when returning work. The grading of work can be detrimental as students will focus on the grade provided and ignore any written feedback that was also included (Black et al., 2002; Wiliam, 2011). This grade focus is also seen when the students compare grades, competing with each other in the process. This results in ego-involvement rather than task-involvement from the delivery of feedback (Beesley et al., 2018; Black & Harrison, 2004; Gitomer, 2011). Teachers have commented on the reality that students do not notice or pay interest to the comments that they write on work when a grade is also provided (Black et al, 2003). There is also evidence that the grading of work can lead to lower future test scores and damage a student's approach to learning (Black et al., 2011).

One issue with the use of grades on work is that there is no guidance to the student on how they can further improve meaning 'grades can demotivate low attainers and give no challenge to high attainers' (Black & Harrison, 2004:11). This was corroborated by Black et al. (2003), who stated that 'a numerical grade does not tell pupils how to improve their work so an opportunity to enhance their learning has been lost' (p. 8). An issue for teachers when it comes

to marking, feedback and the use of grades is that they are often hindered by the marking policies that are imposed upon them (Black et al., 2004) meaning that they are required to provide grades, even if they, or the evidence, disagrees with this.

Often regarded as the other end of the spectrum to the provision of grades is the use of comment only marking. Torrance and Pryor (2011) said that comment only marking 'feedback should identify clearly to what extent and in what ways its [the student's work] quality could be improved' (p. 628) whilst Nicol and Macfarlane-Dick (2006) said that comment only marking is 'anything that might strengthen the students' capacity to self-regulate their own performance' (p. 205). Comment only marking (or feedback) will not be successful purely by removing grades; targets should be set for the students so that they know how to further improve their work (Kennedy et al., 2008). There can be a tendency for praise when providing written comments, these comments could take the form of a 'well done', 'good effort' or 'nicely presented'. Such comments give no direction to the student and are ego-focussed, this form of feedback can be hindering to the effectiveness of the feedback delivered. It was noted by Black and Harrison (2001) that teachers were hesitant to take up comment only marking, despite research evidence of its effectiveness. However, when they did embed this into their practice, they found it to be successful in the classroom.

The type of feedback is not necessarily important if teachers use 'feedback as a purposeful tool to connect with students and encourage them towards their goal' (Purcell, 2017: 114). Large scale studies have been conducted investigating a range of different methods of feedback and their impact on students in a classroom setting. In 1987, Butler conducted research in to four different types of feedback (comments only, grades only, praise and no feedback) with 200 students in Israel. The study was looking at the impact of the feedback on the student's motivation, interest, and performance. It was found that the comment only feedback had the most positive impact on the students. Butler then conducted a similar study in 1988 with 132

mixed ability students. In this later research, the students were split in to three groups with one group provided with only written comments, another with grades only and the third with comments and grades. Butler was investigating levels of interest and performance of the students following the different types of feedback. The research agreed with the study from 1987, with the students receiving comments only showing the highest levels of interest and performance.

Providing individual and unique written comments for all students can seem a daunting task for teachers and may partially explain their reluctance to take on this approach despite the research evidence of its benefits. Until the writing of comments becomes a more natural process for teachers a collaborative effort between teachers on how best to approach the task would be beneficial (Harrison et al., 2002). Writing comments alone will not make the feedback effective, it must also be delivered in a timely manner (Heitnik et al., 2016) with students provided time to improve their work following this feedback (Black et al., 2002; Spendlove, 2015). Feedback is not something to just be provided by the teacher, students must play an active role in the feedback process; they can respond to the feedback, provide a peer with some feedback and work towards becoming self-regulated learners (Sadler, 1989). For the student to fully access this feedback the teacher must present it clearly, so that the student understands how it helps their future learning (Sadler, 1989; Spendlove, 2015). If the student does not have time to act upon the feedback given then the work has not been formative (Nicol & Macfarlane-Dick, 2006).

In 2008, Peterson and Irving conducted a study with 41 students looking at comments and grades in feedback. The students saw grades as more useful for providing information on their progress within a subject and wanted the comments they received on work to be honest as a well as informative. In their study, it was noted that praise featured far too regularly in the feedback provided by teachers meaning that the feedback provided no guidance on how to improve. This agrees with the work of Harrison et al. (2002) that a collaboration between teachers on how best

to provide comments will be helpful to its effective implementation, until such time that teachers are more confident in writing informative comments to students.

A method for engaging students in the feedback process was proposed by Gibbs and Simpson (2004). They suggested that initially students are given their marked work with only comments present. Students will then self-assess their work and attempt to make suggested improvements based on the teacher's comments. Only once this stage has been completed are students then provided with a grade for their work. This method addresses the need for students to be active participants in the feedback process as well as providing a grade that students may find helpful to assess their current level of performance in a subject. Gibbs and Simpson also noted that the written feedback provided must be timely and include corrections where necessary but most importantly 'encourage students to continue studying' (p. 20). A written dialogue between the teacher and their students is a fundamental process to allow students to progress in their studies (Black & Harrison, 2001; Hattie & Timperley, 2007).

This idea of the importance of written feedback contrasts with the systems employed by elite universities in the UK. At these institutions, there exists a tutorial system in which students are set work to complete and bring along to the tutorial to then discuss with their tutor and receive instant verbal feedback on their work (Boulet et al., 1990; Mulliner & Tucker, 2017). In a study consulting 220 Higher Education students, Mulliner and Tucker (2017) found that individual verbal feedback is the most effective method. This agrees with research conducted by Boulet et al. (1990), where 80 secondary school students were given either verbal feedback, written feedback, or no feedback at all. It was found that the written feedback was less effective than the verbal. It may be that students find verbal feedback more effective as it is more accessible to them than written feedback. However, teachers may find the prospect of regularly delivering individual feedback to students too time consuming to fit in to the teaching day.

In their work on feedback, Hattie and Timperley (2007) wrote that the comments provided by teachers to students should be helping the students to answer three questions:

1. Where am I going? (What are the goals?)
2. How am I going? (What progress is being made towards the goal?)
3. Where to next? (What activities need to be undertaken to make better progress?)

(p. 86)

These statements were embedded by nine primary schools into their pedagogical practice over the course of a year (See et al., 2016). The research identified several themes for further research, including the fact that teachers required additional direction on the effective use of feedback with more collaboration between teachers to agree on success criteria. Teachers also needed to no longer see classroom instruction as being the same as delivering feedback.

Students can deliver feedback to their peers, and this can be effective if strategically implemented (Tasker & Herrenkohl, 2016). In an investigation into effective feedback, Gan and Hattie (2014) found similar findings on peer feedback during their research. Their research took place in New Zealand with 121 Chemistry students between the ages of 16-17. Students were provided with success criteria and then asked to provide feedback on a peer's work. Some of the students were given question prompts to aide them in writing annotations on the work, whilst others were not. It was seen that more praise and less meaningful feedback was given by the students without the question prompts than those with the question prompts. This speaks to the need for peer feedback to be implemented strategically as students are likely to need training in how to create meaningful comments. Another investigation into peer feedback was conducted by Tasker and Herrenkohl (2016) in the USA. The study used 30 students aged 12-13 in a science class and agreed with the work of Gan and Hattie (2014) that students use too much praise. Tasker and Herrenkohl found that students need a lot of guidance and training on how to provide useful and constructive feedback to their peers.

There is no doubt from reading the literature that feedback is a powerful tool. It is a 'dialogue between pupils and a teacher [and] should be thoughtful [and] reflective' (Black & Wiliam, 1998b:12). Receiving feedback should empower a student, making them believe that they can achieve the set target, not that they are incapable of further improvement (Higgins et al., 2001).

However, there is still a need for further research into feedback and how best to incorporate it into the classroom and students' learning (Hattie & Timperley, 2007). Whilst literature may suggest that certain feedback methods are more effective than others are, this may not always reflect how students and teachers feel about these methods. Opinions of different methods of feedback may have an impact on how successfully they are implemented and utilised.

Student and Teacher Opinions of Feedback

Research suggests that there is a disparity in opinions on feedback; teachers and students disagree; teachers can disagree with each other and so can students. Ineffective feedback can lead to students developing a negative opinion of the process. In 2016, Agbayahoun published research on feedback from 132 secondary students in Africa. Students had completed questionnaires on the feedback received from their teachers and 65% of students were dissatisfied with the feedback they had received.

Students may have poor opinions of the feedback they receive if they do not understand the learning goals of a task. Their opinion of feedback can be improved by ensuring they understand the learning goals and then receive feedback directly related to these goals (Hattie & Timperley, 2007). Irons (2008) agrees with this point saying feedback 'should be based on understood goals which the student believes are achievable and valuable' (p.23). A more targeted approach to the feedback, which focuses on a few specific aspects of the student's work, will lead

to a greater effort from the pupil in accessing that feedback (Brooks, 2002). Feedback 'will not lead to improvement until a student understands the feedback and applies it to the work' (Brookhart, 2001: 156).

'Pupils will only invest effort in a task if they believe they can achieve something' (Black et al, 2002: 18) and they cannot be a passive recipient of the feedback (Black & Wiliam, 1998a). Students must have opportunity to apply feedback, as well as understanding it, for them to feel that it is meaningful (Irons, 2008). This can cause a problem for teachers as they can find it difficult to plan adequate time for reviewing feedback with students 'due to pressure from curriculum pacing guides or sequencing charts' (Wiliam, 2006: 288) but without time to reflect on feedback it is 'just a message of little use in the learning process' (Gamlem & Smith, 2013: 160). Students themselves must 'assume ownership of a goal' (Sadler, 1989: 129) and have 'a concept of their learning goal' (Brookhart, 2001: 154) for the feedback they receive to directly impact upon their performance. 'Pupils need to change from behaving as passive recipients of the knowledge offered by the teacher to becoming active learners who could take responsibility for, and manage, their own learning' (Black et al., 2002: 21).

To improve student opinion of feedback it should 'avoid comparisons with other pupils' (Black & Wiliam, 1998b: 9) as well as not being written in red pen, being legible and easy to understand (Black et al, 2003). Task-related feedback is more beneficial to students than ego-related feedback and all feedback should be delivered in a timely manner to prevent errors becoming common practice for a student (Tanner & Jones, 2003). Feedback is also a powerful motivator and its role in this area should not be ignored (Dweck, 1999). 'Feedback should be concerned with motivation as well as achievement' (Brookhart, 2001: 155) since students' achievement will be influenced by their own belief about their capacity to learn.

Students do recognise the importance of feedback to their learning. At Aston University, Birmingham (UK), 206 students completed questionnaires on the feedback they received from

their tutors (Doan, 2013). Eighty percent felt that feedback was important to their learning, whilst 89% said that feedback allowed them to make progress and improvements on future assignments. Another larger study into feedback in Higher Education included 3 universities, 20 staff and 776 students (Price et al., 2011). In this research different methods of feedback were trialled including providing comments to students via email, comments on their written work, tick boxes, one to one appointment, peer sessions and debates. Students were least appreciative of the tick box feedback, feeling that their tutors had not spent enough time or effort reviewing their work and that it was a very impersonal approach to feedback. The effectiveness of the one-to-one interview was sporadic; for one member of staff none of the students attended their scheduled meeting. There was, however, an appreciation for variation in feedback methods since engagement can be lost if the process is always the same.

Despite students not turning up to their individual appointments in the study conducted by Price et al. (2011) it was shown that students perceive individual verbal feedback as the most effective method of receiving feedback in a study conducted by Mulliner and Tucker (2017). Their research involved Higher Education institutions in the UK with 26 staff and 94 students taking part. Staff agreed with the students that individual verbal feedback was the most effective (95% of staff in total) however; they preferred to provide typed feedback for students. The reasons for this are related to time constraint issues. It takes a lot of time to see all students individually, assuming that they all attend their allocated appointment and do not have to be chased or rearranged. Verbal feedback can also be employed alongside other methods, such as written feedback, with the combination being of greater advantage than one method alone. This was shown in a study of 72 students aged 16-18 conducted by Van der Schaff et al. (2013) where the students who received verbal and written feedback felt more reflective about their work and that it was more beneficial than written feedback alone.

Students view teachers as being experts and so want to feel that they have received adequate input from them when accessing feedback. If students spend very little time doing anything with the feedback, they are likely to find it a negative experience. This was shown through the work of Gamlen and Smith (2013). In a very small sample of 11 students at four secondary schools in Norway, Gamlen and Smith saw that students perceived feedback as positive and useful if they spent time correcting or improving their work after receiving feedback. The converse was true if little to no time was spent using the feedback. Students were most interested in how the feedback allowed them to progress with their learning. From interviews with students, it was noted that students felt feedback from their teachers was most effective when it 'clarifies goals … gives a sense of direction and purpose … identifies mistakes … and provides advice' (Askew, 2000: 54-55).

In a two-year development project involving six secondary schools in Norway, Havnes et al. (2012) used surveys and group interviews with both students and teachers to investigate their opinions on feedback. Students' felt some subjects were better at incorporating feedback into future tasks whilst other subjects did not even acknowledge the feedback or provided feedback that was not useful. The teacher's attitude towards delivering feedback influenced students' opinion of the feedback they were receiving, and the combination of subject and teacher played a role in determining how useful students' felt feedback was in that lesson. The teachers that were interviewed felt that the students they saw as being average/clever were more likely to be proactive with the feedback they received and took this on board when completing future tasks. However, students who were performing at a lower level and in need of extra direction were more likely to ignore feedback and not act upon the guidance given.

It was noted earlier in the review of literature that the use of praise within feedback can have a detrimental effect upon students and there are several studies that have looked specifically at the use of praise and how students feel about its use in feedback. Student opinion on praise

was included in the work of Gamlen and Smith (2013) when looking into the implementation and effectiveness of peer feedback. Students were interviewed about their experiences of peer feedback, and whilst they enjoyed working with peers, they admitted to finding giving feedback a challenge as they had always been taught to be positive towards each other. This meant that praise featured too regularly in the feedback they provided and that they felt this feedback was then less effective. A study in Japan measuring student's self-efficacy (Ruegg, 2018) compared teacher feedback with peer feedback. Self-efficacy is defined as one's own confidence and Ruegg suggested that this was a major factor in the effectiveness of feedback. From the research, it was found that praise featured regularly in peer feedback having a negative impact on the feedback delivered. As a result of this teacher feedback appeared to be more effective as praise featured less often.

A further study looking specifically at the effect of praise in feedback (Cowie, 2005) was conducted in New Zealand with 70 students between the ages of 11 and 15. When praise featured in the feedback that students received, they were unhappy, as there was no explanation as to why the work had been good or bad. Students wanted more detail from the teacher so that they would know what things to keep and what to change when completing future tasks. Students also felt that teachers had not assessed their progress in lessons if they had not spoken to them individually during the lesson. This agrees with articles earlier in this review about the positive effect of individual verbal feedback (Boulet et al., 1990; Mulliner & Tucker, 2017).

Teachers know that assessing students' work and providing feedback is important to the learning process but 'the effort that many teachers devote to marking work may be misdirected' (Black et al., 2003: 46-47). There is a danger that teachers 'produce feedback because you think you should be doing it as part of your job and you end up actually producing the feedback to satisfy yourself' (Irons, 2008: 54). This idea was also highlighted also by the work of Black and Wiliam (1998b), 'the collection of marks to fill up records is given greater priority than the analysis

of pupils' work to discern learning needs' (p. 6). Teachers need to design the tasks that they give students appropriately so that they can deliver worthwhile feedback (Baird et al., 2014).

For teachers providing feedback is a time-consuming task. If they do not see it as a worthwhile exercise, they are more likely to sacrifice it when pressures mount from other directions (Irons, 2008). Teachers must 'buy-in' to the feedback system in use to utilise it effectively otherwise, they may make no effort to 'fit it into an already full workload' (Irons, 2008: 71). This was highlighted during an interview with a teacher in the work of Black et al. (2003):

> I mark well once every 3 weeks at present. In theory I would like to do this more, but until we halve class sizes or contact time or give up having a life, I don't see this as likely' (p. 47).

Teachers face many demands on their time, and I have noticed within my own teaching experience that I can fall back on the 'tick and flick methodology' for lack of time or because I fear that management will think I am not marking enough if there is not red pen in books. Until there is a change in the expectation of parents, students and management of what feedback is it will be difficult for teachers to adopt new approaches individually.

The 'ultimate goal of feedback should be to teach students how to regulate their own learning' (Tanner & Jones, 2003: 73) and for students to be able to self-assess effectively, time must be spent ensuring students fully understand the task and success criteria (Black & Wiliam, 1998b). Students will not be able to self-assess automatically and time will need to be dedicated to teaching this skill, otherwise students may fall back on the teacher relying on their 'more extensive and elaborate knowledge base' (Sadler, 1998:80). Students being able to successfully monitor their own progress is the overall goal of education (Brookhart, 2001; Sadler, 1989; Sadler, 1998).

Being a reflective learner is a key skill both in education and in work, making the ability to self-assess a beneficial skill for students to learn (Irons, 2008). Providing feedback leads to 'effective error detection skills…[which] leads to own self-feedback' (Hattie & Timperley, 2007:

86). Those students who are more interested in success criteria and take more responsibility for their own learning are ultimately more successful (Gamlem & Smith, 2013). Whilst a key skill, there is no evidence in the literature that student self-assessment should completely replace written feedback from the teacher, however it can form a valuable aspect of feedback and its inclusion can help to improve student opinions of the feedback process.

The variety of opinions in literature on feedback has been seen in this review. Poor student opinions can stem from poorly defined learning goals (Hattie & Timperley, 2007) or from the lack of engagement with the feedback method by the student (Black & Wiliam, 1998a; Irons, 2008). Feedback should be related specifically to the task the student has completed (Tanner & Jones, 2003) and avoid excessive use of generic praise (Gamlen & Smith, 2013). There are challenges for teachers in the implementation of feedback in relation to the time constraints they face within their working day (Wiliam, 2006) and this can lead to poor teacher opinions. However, students can have an overall positive view of feedback, although this can vary with age and subject as well as well as with feedback method (Doan, 2013; Price et al., 2011).

Summary of Literature Review

From the reviewed literature, it can be seen that assessment is an integral part of our current educational system and that it demands a significant amount of teacher time (Butt & Lance, 2005). However, time pressures upon teachers means that these assessments are not utilised to full effect and can carry negative perceptions from both teachers and students (Butt, 2010). High stakes external summative assessments are most prominent in the minds of students, and often teachers, however students most often encounter summative assessment in the classroom (Brookhart & Durkin, 2003). Despite their prevalent use in the classroom teachers are often ill equipped to design and deliver these assessments effectively (Goslin, 1967; O'Sullivan & Chalnick, 1991; Roeder, 1972). Teachers are open to the research on good classroom assessment and

acknowledge that their delivery does not match best practice (Black et al., 2010; McMillan & Nash, 2000; Rieg, 2007).

Students feel the assessments they are exposed to at school are often unhelpful (Rieg, 2007). However, this could be improved with effective feedback that motivates a student to further learning and avoids heavy emphasis on grading (Harlen & Crick, 2002). Summative assessment can be used as formative assessment if correctly implemented (Black et al., 2003; Kennedy et al., 2008; Wiliam, 2011) and an important part of this is the feedback the students receive and their involvement in this feedback (Black et al., 2010).

Feedback itself takes many forms but is ultimately a process of communication between a teacher and student that allows the student to make progress (Black & Wiliam, 1998a; Leahy et al. 2005) but does not feature as frequently as it should in the classroom (Laws, 2013; Marsh, 2006; Ramaprasad, 1983). Written feedback from teachers is important (Nicol & Macfarlane-Dick, 2006) but the use of grades should be avoided (Black et al., 2002; Black et al., 2003; Wiliam, 2011). Providing only written comments without a grade, or comment-only marking, is a powerful feedback method as supported by the findings of Black et al. (2004) and Butler (1987, 1988) and could be one of the best ways to deliver feedback to students.

However, written feedback is not the only method that can be used when reviewing work with a student. Verbal feedback can be an effective method, as shown by Mulliner and Tucker (2017), particularly amongst older students. Teachers have acknowledged the benefits of verbal feedback, but it does throw up issues related to the time needed to provide individual feedback to all students. Another possibility is students providing feedback to their peers, although they will need additional support and structure for this method to be effective (Gan & Hattie, 2014; Tasker & Herrenkohl, 2016). Ultimately the goal of feedback is to teach students how to self-assess and to become more reflective learners as well as closing the gap between their

current and potential future attainment (Brookhart, 2001; Tanner & Jones, 2003; Sadler, 1989; Sadler; 1998).

From my review of the associated literature, I have identified three questions to focus on answering through my research:

1. How do students perceive the feedback they currently receive following in-class summative assessment?
2. What are students' views when different methods of feedback are employed?
3. How can teacher's feedback be improved?

These questions will allow me to identify any positive or negative opinions students may have about the system currently in place to review summative assessments in class. I will then trial a variety of feedback methods that have been mentioned in literature to see students' opinions of them. Finally, I want to see the opinions the students hold about how feedback can be improved in future.

Methodology

This research is multi-phase practitioner research conducted at the school where I am employed in a professional capacity (as a teacher) (Denscombe, 2017). I have chosen this method of research as I intend to trial several feedback methods and evaluate the impact of each method before making a conclusion on which method or methods of feedback have proven the most successful.

The setting for this research is an independent boys' school in Birmingham, UK, where students range from age 11 – 18. For this research I will be using two classes of year 12 pupils (age 16-17), totalling 17 students, who are both taught physics by myself and a colleague. Feedback will be delivered to the students by myself and my colleague depending on who is the first to

reach a summative assessment with the class. This will allow more opportunities for the feedback methods to be trialled within a smaller time frame.

These students were also selected as they have greater experience of both high and low stakes summative assessment and receiving feedback on these from their previous years of education. They have chosen to study Physics in the Sixth Form and should be more engaged with feedback, wanting to progress their learning in the subject because of this choice. Smaller class sizes in this year group also means that delivering different feedback methods will be less time consuming.

Ethical Considerations

As this research was carried out with 16 – 17 year olds it was necessary to obtain ethical approval before proceeding with any data collection. An application was made to the Central University Research Committee (CUREC) and approval was granted (see appendix 1).

Practitioner research can pose a conflict of interest due to the dual role of both researcher and practitioner (Cochran Smith & Lytle, 2009; Fox et al., 2007). This conflict of interest arises as a practitioner will be more interested in the student's needs and their outcomes whereas there is the possibility that a researcher will be solely interested in the outcome of their research to the possible detriment of the students. However, I believe this conflict is mitigated by the purpose of this research. This research seeks to improve professional practice within the school, initially my own and later that of colleagues, meaning that the interests of the researcher and the interests of the practitioner are aligned.

The students were briefed about the research, by me, during a lesson. I explained to them why I am conducting the research and how I will be conducting the research (see appendix 2). It was made clear to the students that they do not have to participate in this research if they do not want to and that they could withdraw from the study at any time (BERA, 2011). To further comply

with the ethical guidelines from BERA (2011) it was necessary to ensure anonymity for students in any interviews or questionnaires, as such no real names are included when findings are presented or during the discussion of any data collected.

After the briefing, students were given time to consider the research proposal and their involvement in it away from the classroom. They were not asked if they were willing to participate until their next lesson and no sooner than 48 hours after explaining the research to them. This allowed students to fully consider the implications of their involvement without peer pressure or the perceived pressure from a teacher whom they may wish to please. Those students who were willing to participate in the study signed consent letters indicating that they are participating willingly in the study (see appendix 3).

Piloting and Collaboration

During departmental discussions, both formally at department meetings and informally in the office, it became evident to me that feedback following summative assessments was an area several colleagues felt could be improved. I shared their opinion, and it was for this reason that I selected this research project.

My main collaborator for this research was one other Physics teacher with whom I shared the teaching of the two classes that contained the students who participated in this study. The collaboration in the project was that this teacher helped me to draft the questionnaires to be used with the students, delivered some of the trialled feedback methods to the students and gathered some of the questionnaire responses. They also fed back to me their observations on the students' engagement with the research and the comments they were making in class about the process.

I also collaborated with the rest of the physics department by keeping them informed of the research progress during our department meetings and will be sharing the results of the

research with them during an INSET day at the start of the new academic year. Outside of my department I collaborated with colleagues in other departments through a teaching and learning group that met once a week. I shared with them my literature review and research questions, prompting some colleagues to begin their own small scale research projects within their own departments. I will be sharing my final findings with them next term.

The questionnaires used in this research were trialled with a different Y12 physics class to the two involved in the research project. These students were chosen as they were the same age range and of a similar academic ability to those students participating in the research. The pilot was used to check that the questions were pitched at an appropriate level and that there were no misunderstandings or misinterpretations of the questions. The students in the pilot group were asked whether any of the questions had been unclear or ambiguous, but none had, so no questions needed to be altered.

Justification of Research Instruments

Questionnaires were used as they have the advantage of being quick to complete and relatively straightforward to analyse to provide quantitative data and graphs. They are also anonymous meaning that the students will likely be more honest in their assessment of the feedback they have received (Daniel 2016; Munn & Drever, 1990). A disadvantage of using questionnaires is that they often have a low completion rate. This was addressed by delivering the questionnaires during class time for the students to complete immediately and then submit to ensure a higher rate of return. There is also the possibility that students will feel that they are not really participating in the study if the scope of the questions and responses on the questionnaire are limited or restrictive (Daniel, 2016). With questionnaires 'the information collected tends to describe rather than explain why things are the way they are…[and] can be superficial' (Munn & Drever, 1990: 5). It is for this reason that I had intended to conduct interviews with some of the students to allow

them to elaborate on their thoughts and opinions and explain why they feel a certain way so that the responses are not always superficial. However, due to lost time in school, from lockdowns related to COVID-19, I took the decision to remove the interviews to decrease the amount of time required for the data collection to take place.

Within the questionnaire, there are a combination of questions with a Likert-scale response alongside questions with space for longer written answers. The benefit of using a Likert-scale is that it is quick for the participant to answer and easy to analyse quantitatively to provide comparisons between feedback methods. It has also been shown that children between the age of 6 to 18 years prefer the Likert format when answering a questionnaire (Laerhoven et al., 2004). The longer written responses will allow elaboration from the students.

There is a debate in the available literature as to which type of Likert scale is the most favoured. In 1932, Likert stated that a five-point scale can be more satisfactory than a three-point scale. However, there is the danger that with a five-point scale students will simply opt for the middle response giving no discernible indication of a preference or a dislike of the feedback they have received. This could make answering the research questions more difficult. If there are an even number of points on the scale this can address the issue of students simply opting for the middle of the scale (Cohen et al., 2018) and as the number of points on the scale increases so does the reliability (Hartley & Betts, 2010).

This idea of a larger scale meaning greater reliability is not agreed upon by all and there are research studies that have shown a three-point scale is good enough for a Likert-scale (Jacoby & Matell, 1971; Lehman & Hulbert, 1972; Mellor & Moore, 2014). A smaller scale should be easier for students to comprehend since they may be unfamiliar with a Likert-scale and how to use it to express their answer and thought must be given as to whether the students understand the different response options (Mellor & Moore, 2014). When the scale is larger, for example a five-point scale, there are a range of options but the students may not all have the same understanding

of what is meant by ‘strongly agree’ or ‘mostly agree’. It could be considered preferable to have a dichotomous scale as everyone Is clear on what is meant by ‘agree’ or ‘disagree’ but for this research study such limited responses will give little differentiation in opinion between the different feedback methods and as such this type of scale will not be used. A three-point scale still provides clarity on ‘agree’ and ‘disagree’ but with a neutral option for those who want it (Krossner & Presser, 2009). As I wish to gain an understanding of student opinion on methods of feedback, I did not feel that a three-point scale would give sufficient differentiation between methods and as such a five-point scale was used for the questionnaires. This allows a neutral option but also allows students to like multiple methods of feedback but still indicate that they felt one was better than another.

Phases of Research

The research centred on the completion of questionnaires by the students at different stages during the intervention. These will include a pre-intervention and post-intervention questionnaire as well as a questionnaire following each different trialled method of feedback.

- **Pre-intervention questionnaire**

  During a physics lesson students completed an initial questionnaire (see appendix 4) before any intervention. This gave a baseline for the opinions of students towards the current feedback they receive following summative assessments. These questionnaires were distributed, filled in and collected back during lesson time to ensure a high response rate from the students. From the questionnaire I was able to gauge initial opinions to feedback to then compare with final opinions following the intervention.

- **Feedback method 1 and questionnaire**

  Following an in class summative assessment, with either myself or my colleague, feedback was delivered via the first method during a subsequent lesson. After this experience students were asked to complete a questionnaire specifically about that feedback type (see appendix 5), again during a lesson. This ensured high levels of participation.

- **Feedback method 2 and 3 and questionnaires**

  Feedback type 2 and 3 were then delivered in the same manner as feedback type 1 and students completed the same questionnaire (see appendix 5) after each feedback experience. This allowed comparison of opinions across the three trialled feedback methods.

- **Post-intervention questionnaire**

  Following the completion of the questionnaire regarding feedback type 3 students were then asked to complete a final questionnaire (see appendix 6) during a subsequent lesson to ensure a high participation rate.

The summary schedule for the intervention and data gathering can be seen in the flow chart below.

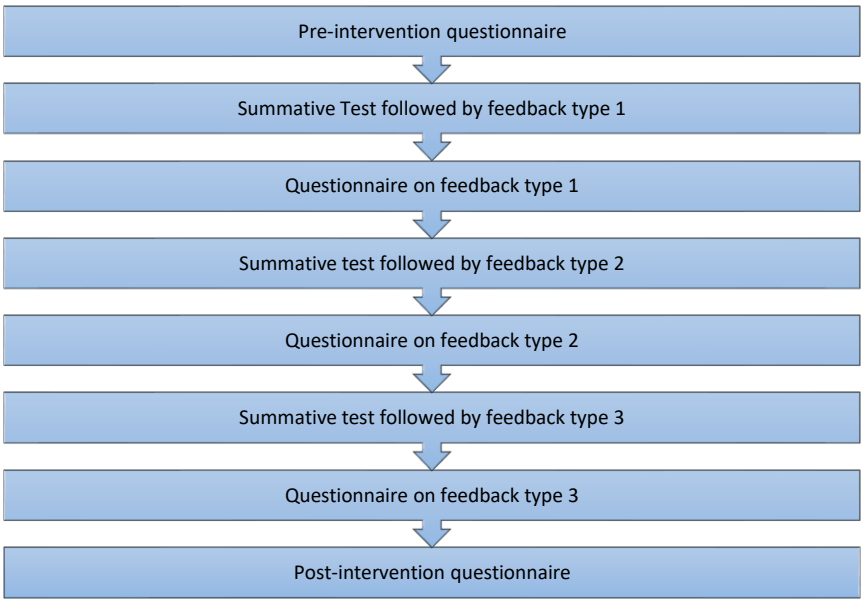

Diagram 1: Flow chart of intervention and data gathering methods

Table 1 shows the research instruments and methods of data analysis that will be used to answer the research questions that arose from my literature review.

Research Questions	Research Instruments	Methods of Data Analysis
1. How do students perceive the feedback they currently receive following in-class summative assessment?	Pre-questionnaire	Quantitative and Qualitative
2. What are students' views when different methods of feedback are employed?	Teacher Observations Questionnaires following trial of new feedback method	Qualitative Quantitative and Qualitative
3. How can teachers' feedback be improved?	Teacher Observation Discussions Pre and post questionnaires Questionnaires following trial of new feedback method	Qualitative Quantitative and Qualitative Quantitative and Qualitative

Table 1: Summary of research questions, research instruments and methods of analysis

Methods of Feedback to be Trialled

Based on the literature the following three methods were chosen to be used as the three feedback types in this trial.

1. **Comment only feedback**

   Students were presented with their script containing only written comments from the teacher indicating where there were errors or mistakes in their work. There were no ticks or crosses on the work and no grade provided to the students. Students then spent lesson time reviewing the comments and making corrections with the use of a

mark scheme, textbooks and their prior class notes to help them (Black et al., 2003; Black et al., 2011; Butler 1987).

2. **Verbal feedback**

   Students were given their marked script with minimal written comments from the teacher. Whilst the students were undertaking an alternative task in class the teacher spent 5 to 10 minutes with each student discussing their paper. Following this discussion students were provided with their grade and a mark scheme to take away (Boulet et al., 1990; Price at el., 2011; Mulliner and Tucker, 2017; Van der Schaff et al., 2013).

3. **Self-Assessment**

   Prior to marking the summative assessment, the teacher made a second copy of each student's test paper. On one test paper the teacher marked and graded the student's work, keeping this for their own records. In class the student was then presented with a clean unannotated copy of their test along with a mark scheme. Students then marked and corrected their own work before letting the teacher know what they believed their final score should be. The student and teacher could then have a dialogue during class if there was a discrepancy between the teacher mark and the student mark, with the teacher explaining in more detail why marks had or had not been awarded (Brookhart, 2001; Sadler, 1998; Tanner and Jones, 2003).

Methods of Data Analysis

A mixed methods approach (quantitative and qualitative) was adopted for the data analysis on this study. By using both approaches it reduces the bias of just using one method alone (Creswell, 2003).

The questionnaires (see appendices) featured some questions with a Likert scale as well as some open-ended responses. Responses from the Likert scale questions were subject to a quantitative analysis with a mean and standard deviation calculated for each question. Likert responses from the pre-questionnaire and the final questionnaire were compared as were responses from the three questionnaires about each feedback method. Those questions that were open-ended were subject to a qualitative thematic analysis. The pre-questionnaire and final questionnaire had several identical questions to allow a comparison of opinions before and after the intervention. The questionnaire delivered after each different feedback method was identical to allow direct comparison of opinions on each method. Prior to the questionnaire being completed by the students taking part in the research study they were trialled with another year 12 physics class. This allowed the questions to be amended if there was any ambiguity or if the students were unclear of what the question was asking them.

Findings

The presentation of the findings has been organised around the questionnaire data rather than individual research questions. This is because questionnaires could provide an insight to more than one research question. Following the analysis of the individual questionnaires the findings will be summarised by research question.

The questionnaires contained a mixture of Likert scale responses, some with space for a comment, and some open-ended questions. A score higher than 3 (the midpoint of the Likert scale) was

considered as a positive response to the question, whilst a score less than 3 was considered a negative response to the question.

Pre-intervention Questionnaire

This questionnaire was completed during lesson time and had a 100% response rate on all questions. Table 2 shows the mean for the Likert scale questions from the questionnaire.

Question / Statement		Mean	Standard Deviation
1	Do you receive feedback following a summative assessment?	1.35	0.48
3	I think feedback allows me to progress in Physics.	1.47	0.50
4	I think feedback supports my Physics learning.	1.35	0.48
5	I find the feedback I receive following a summative assessment to be encouraging.	2.12	0.58
6	I find the feedback I receive following a summative assessment to be demotivating.	3.94	0.80
7	All summative assessments should be marked by a teacher.	1.59	0.84
8	How often do you apply the feedback you receive following summative assessments to future pieces of work?	1.88	0.68
9	Feedback from summative assessments is received within a period that Is beneficial to me.	1.94	0.87

Table 2: pre-intervention average scores

The standard deviation scores show most students agreed with their answers to questions 1,3,4 and 5 with a slightly greater difference in opinion between students on questions 6,7,8 and 9.

Question 1 demonstrates that students do understand that they are receiving feedback from their teachers following summative assessment with a very positive score of 1.35. Question 2 was an open-ended question asking students to detail what they classify as feedback. Only three students referred to receiving a mark or grade in their response to this question. Specific mention of the teacher in relation to feedback was made by five students, for example “teacher expressing their views on how the test went” indicating a dialogue between teacher and student (Black & Wiliam, 1998; Leahy et al. 2005).

Questions 3 and 4 were both asking how students perceive the feedback they receive in relation to their improved knowledge and understanding of the subject and whether the feedback is allowing them to make progress in this subject. Both questions have a similarly positive response from students, showing that they feel the feedback allows them to make progress.

Questions 5 and 6 were asking the students about whether they find the feedback they receive to be motivating or demotivating. The questions were phrased oppositely as a check that students do really find the feedback to be motivating or demotivating. For the answers to corroborate one another the responses should be oppositely positive and negative. The score of 2.12 for question 5 indicates students find the feedback to be encouraging and a score of 3.94 for question 6 corroborates that they do not find the feedback demotivating. In the space for explaining their response to question 6, nine of the students referred to the fact that even if they got answers wrong, which may initially be demotivating, they found it useful to know how to "improve" or make "improvements" from these mistakes. The feedback is acting as communication between teacher and student on how to progress from where they are to where they could ultimately be (Black & Wiliam, 1998; Leahy et al. 2005).

Positive responses were received for Questions 8 and 9 with students in agreement that summative assessments should be marked by the teacher, that they do apply the feedback they receive to future pieces of work and that they are receiving their feedback in a beneficial time period.

For question 10 when completing the statement 'Feedback from summative assessments is…' twelve students responded in their answer that it was "useful" or helpful" which agrees with their responses to questions 3 and 4 earlier in the questionnaire.

When asked in question 11 to identify ways in which feedback from summative assessments could be improved there were a variety of responses. Five students wished to see more "personal" feedback after their summative assessments and a further four students referred

to “individual” feedback or “one-to-one” sessions with the teacher. There were also requests from students for further problems to be set on questions that they got wrong so that they could implement lessons they had learnt from the test and do some further practice. This would allow them to act upon the feedback received making it more formative (Nicol & Macfarlane-Dick, 2006).

Verbal Feedback

This questionnaire was completed during lesson time to ensure all students responded. The questionnaire consisted of some Likert scale responses, with room for a comment, and one open ended question. Table 3 shows the mean score for the Likert scale questions.

Question / Statement		Mean
1	This feedback allows me to progress in Physics	1.24
2	This feedback supports my Physics learning	1.47
3	I find this feedback encouraging	1.71
4	I find this feedback to be demotivating	4.35

Table 3: verbal feedback average scores

It can be seen from these responses that students were very positive about verbal feedback allowing them to make progress and supporting their learning. They also agreed that this feedback method was encouraging with an average score of 1.71 and not demotivating with an average score of 4.35 to question 4.

In the space for additional comments to questions 1 to 4, 100% of students provided comments for questions 1 and 2, 94% wrote a comment for question 3 and 71% provided a comment to question 4. Below are some samples of the comment responses to these four questions, demonstrating how students have responded positively to the personal nature of this feedback method.

- Question 1 comments:

  “Allows me to see where I went wrong and how to correct my mistakes. Helps in my personal development rather than having feedback for the whole class.”

  “It's a lot easier to ask questions - usually mark schemes aren't sufficient explanation.”

  “You can easily ask follow up questions to strengthen ideas. This is often difficult in class-wide feedback and often times errors of the class don't apply to the individual. This is often the case with me.”

- Question 2 comments:

  “One-to-one discussion allows you to talk about specific issues with your physics learning with the teacher.”

  “I find it much more encouraging and engaging when verbal feedback is given.”

  “You gain a better understanding as the feedback is specific and personal.”

- Question 3 comments:

  “Seeing how easy it is to pick up marks was encouraging.”

  “I think it is much more encouraging as the feedback is much more personal.”

  “It encourages me to not look at the mark but rather what I got wrong and prompts me to go over these topics I got wrong in my own time.”

- Question 4 comments:

  “This method gives the opportunity to go over anything needed. I thought one-to-one feedback might be intimidating, but it wasn't. Fortunately, through thorough feedback, the session was, in fact, motivating.”

  “The teacher can be a lot more motivating for me to do better rather than simply staring at a mark scheme highlighting my mistakes, which can be a lot more demotivating. In addition, the teacher explains concepts/working not found clear on the mark scheme, allowing me to feel more confident about the ways I can improve.”

Question 5 on the questionnaire was an open-ended question asking students for their views on how this form of feedback could be further improved. There was an 88% response rate for this question. Four students commented that they were happy with the feedback method as it was and would make no changes to it. Five students mentioned a desire to be set some further problems on topic areas that they got wrong on the test for further practice after receiving their feedback. A request for the feedback to also include a written element came from three students, as they were concerned, they would not remember the conversation and wanted some written comments to aide their memory. There were two students, who whilst being positive about the method, felt that overall, it took up too much lesson time. This opinion was shared by myself and my colleague when we sat down to reflect upon the method. A possibility for decreasing the amount of lesson time taken up by verbal feedback would be to schedule meetings outside of class, although this presents other challenges. Alternatively verbal feedback could be pre-recorded by a teacher and sent to a student, although this prevents the student from asking reactive questions, they would have to ask questions in the next lesson.

Comment Only Feedback

This questionnaire was completed during lesson time to ensure all students responded. The questionnaire consisted of some Likert scale responses, with room for a comment, and one open ended question. Table 4 shows the mean score to the Likert scale questions.

Question / Statement		Mean
1	This feedback allows me to progress in Physics	2.75
2	This feedback supports my Physics learning	2.94
3	I find this feedback encouraging	3.19
4	I find this feedback to be demotivating	3.38

Table 4: comment only average scores

It can be seen from these responses that the students posted an almost neutral score to questions 1 and 2 indicating that they were not confident about how well this method of feedback was supporting their learning and progression. There is a similar pattern then repeated in questions 3 and 4 with the average score showing a marginal negative response to the two questions. This again indicates that students were not sure about how encouraging or demotivating this feedback method had been.

In the comments that were written in support of these Likert scores there was a large amount of variation in opinions. A selection of comments can be seen below. These comments demonstrate the disagreement amongst the students about whether this was a positive or negative feedback experience.

- Question 1 comments:

  "The comments were far more helpful than just giving a number by each question. The explanations were also far clearer than any mark scheme could be."

  "Not very good in terms of knowing overall performance, hard to know what I got right. The explanations do help highlight areas to improve and ways to improve."

- Question 2 comments:

  "Having no quantitative mark makes me unsure on progress."

  "Not sure whether I just started in the wrong place or if I went wrong somewhere along the way."

  "The explanations help and explain things I got wrong."

- Question 3 comments:

  "I only feel motivated when I can tell if its fully wrong or partly wrong."

  "Better than numbers as I then focus on re-trying questions."

  "There is quite thorough feedback, which is a little daunting as it appears that there are lots of areas for improvement, despite this not necessarily being the case."

- Question 4 comments:

  "Upon reading the comments, after the initial shock of all the red pen, it transpires that there is actually not too much left to improve, so overall I feel this method is neither motivating nor demotivating."

  "Lots of red pen feel demotivating and it just makes me unsure of how I'm performing making me more worried about it."

Question 5 on the questionnaire was an open-ended question asking students for their views on how this form of feedback could be further improved. There was a 94% response rate for this question. Only one student commented that there was nothing they would change about the feedback method and described it as "very good". However, ten students made mention of a "mark" or "grade" as a way in which this feedback method could be improved. This was particularly interesting since only three students had mentioned marks/grades/score as being what feedback is during their pre-intervention questionnaire. Either the students had been attempting to avoid saying this during their pre-intervention questionnaire or had not realised its importance to them until it was removed during this feedback method.

Self-marking Feedback

This questionnaire was completed during lesson time to ensure all students responded. The questionnaire consisted of some Likert scale responses, with room for a comment, and one open ended question. Table 5 shows the mean score to the Likert scale questions.

Question / Statement		Mean
1	This feedback allows me to progress in Physics	1.75
2	This feedback supports my Physics learning	2.13
3	I find this feedback encouraging	2.38
4	I find this feedback to be demotivating	3.88

Table 5: self-marking average scores

The average scores for questions 1 and 2 indicate that the students feel positively about this method of feedback supporting their learning and progression in the subject. As to whether this feedback method is encouraging the average score is only just on the positive side of a neutral response, however, there is clear indication in question 4 that they do not find it demotivating.

In the comments that were written in support of these Likert scores there was some difference of opinions noted. A selection of comments can be seen below.

- Question 1 comments:

  “It allows me to see where I went wrong first-hand.”

  “The mark scheme gives no explanation behind answers, which makes it harder to know how I must progress, and what knowledge I'm lacking. It's also difficult to understand the mark scheme at times, making it difficult to judge where I've gone right or wrong.”

  “This allows me to understand the marks awarded to me and gives me the opportunity to write and understand my own mistakes.”

- Question 2 comments:

  “It's good being able to see where I went wrong myself, while also being able to ask the teacher any questions I might have.”

  “It is a little easier to see where I went wrong.”

  “This method gave me more active time with the test paper, which is itself a valuable resource for supporting physics learning. I view that as a positive.”

- Question 3 comments:

  “Self-marking makes me focus a lot more on my mistakes, as I'm actively looking for mistakes while marking my own work.”

  “You have to be honest with yourself which gives you a true picture of your level.”

"While it's nice seeing how well I'm doing it's also a good reminder of how annoying the mark scheme can be, which is not encouraging."

- Question 4 comments:

  "With self-marking it's easier to focus on mistakes more than anything else, which can be demotivating if there are so many mistakes, especially all cluttered together."

  "Although I was quite harsh on myself I did not feel demotivated."

  "This isn't demotivating as it is a private method and it encourages rather than demotivates."

Question 5 was an open-ended question asking students for their views on how this form of feedback could be further improved. There was an 82% response rate for this question. In their comments five students had indicated a desire for some written feedback or additional explanations to accompany the mark scheme, as they had found the mark scheme vague or difficult to interpret. Three students asked for verbal feedback to be used alongside this method of feedback and two students commented that they would not make any changes to the method.

Comparison of Comment Only, Verbal and Self-Marking

Since students were answering the same questions after each different method of feedback it is possible to compare their opinions to the Likert scale questions. The comparison of the mean scores along with the standard deviation of responses can be seen in table 6.

Question / Statement		Verbal		Comment		Self-marked	
		M	SD	M	SD	M	SD
1	This feedback allows me to progress in Physics	1.24	0.42	2.75	1.20	1.75	0.66
2	This feedback supports my Physics learning	1.47	0.50	2.94	1.20	2.13	0.70
3	I find this feedback encouraging	1.71	0.46	3.19	0.88	2.38	0.86
4	I find this feedback to be demotivating	4.35	0.59	3.38	1.27	3.88	0.60

Table 6: average scores and standard deviations for different feedback methods

The data presented in table 6 suggests that students were most positive towards verbal feedback, from the three trialled methods. It has the most positive average scores of 1.24 and 1.47 for questions 1 and 2 respectfully, and both also have a low standard deviation. This indicates the students found this method to be the most helpful in supporting their learning and progression. Students also placed this feedback as the most encouraging (most positive average score to question 3) and least demotivating of those trialled. Again, responses to questions 3 and 4 for verbal feedback had a very low standard deviation, indicating strong agreement amongst the students. These results agree with the work of Mulliner and Tucker (2017) and Boulet et al. (1990) who both found verbal feedback was perceived as the most effective method of receiving feedback by students, particularly amongst older students.

Comment-only feedback was the least well received of the three trialled feedback methods. This contrasts with the literature, which identified that providing written only comments is a powerful method of feedback (Black et al. 2004; Butler, 1987,1988). There were much larger standard deviations for all questions representing a greater range of opinions on this method. Some students were positive, and others were negative about the method resulting in an average score very close to neutral with regards to how helpful this method is for progression and learning.

Post-Intervention Questionnaire

This questionnaire was completed during lesson time to ensure all students were able to respond. Questions 1 to 3 and 5 to 9 on this questionnaire also appeared on the pre-intervention questionnaire allowing for a comparison of responses. Table 7 shows the mean score and standard deviation for the Likert scale questions in the post-intervention questionnaire along with the values from the pre-intervention questionnaire.

Question / Statement		Pre-intervention		Post-intervention	
		Mean	Standard deviation	Mean	Standard deviation
2	I think feedback allows me to progress in Physics.	1.47	0.50	1.41	0.49
3	I think feedback supports my Physics learning.	1.35	0.48	1.24	0.42
5	I find the feedback I receive following a summative assessment to be encouraging.	2.12	0.58	2.18	0.78
6	I find the feedback I receive following a summative assessment to be demotivating.	3.94	0.80	4.00	0.69
7	All summative assessments should be marked by a teacher.	1.59	0.84	1.71	0.46
8	How often do you apply the feedback you receive following summative assessments to future pieces of work?	1.88	0.68	1.88	0.58
9	Feedback from summative assessments is received within a period that Is beneficial to me.	1.94	0.87	1.53	0.50

Table 7: average scores and standard deviations for Likert questions in pre and post intervention questionnaires

It can be seen from the responses that following the opportunity to respond to a greater variety of feedback methods students are now more positive that the feedback they receive supports their learning and helps them to progress in physics. There has been a small decline in positive responses to the question of whether the feedback they receive is motivating, this is likely linked to the negative responses seen in the comment only feedback and the prominence of this in the memory of the students. However, students remained consistent in their feeling that the feedback they received was not demotivating.

Having been exposed to alternative methods of feedback students were less sure that all assessments should be marked by teachers with the average score decreasing by 0.12. There was the same average score regarding the application of feedback, but the standard deviation had decreased showing a greater agreement between the students on their responses. Students were

more positive that the feedback they were receiving was delivered within a time frame that was beneficial to them after the intervention.

In response to question 1 regarding what students classify as feedback there was an increase from three to seven students that referred to receiving a 'mark', 'score' or 'grade' from the pre-intervention questionnaire. When the marks were removed for the comment only feedback it is possible that this highlighted to students the importance they place on this, something they had not acknowledged in the pre-intervention questionnaire.

As part of the post-intervention questionnaire students were asked which of the trialled feedback methods they found most useful for future progression in their Physics studies. Table 8 shows the responses to this question.

Type of feedback	Number of students
Comment only	2
Verbal	10
Self-assessment	5

Table 8: Responses to the question 'Which method of feedback did you find the most useful for future progression in your Physics studies?'

The verbal feedback was seen as the most useful by students for future progression, an outcome that agrees with the positive responses to the questionnaire following the trial of this feedback method. Comment only was identified as the least useful with only two students selecting this option. This also agrees with the responses received after this feedback method was trialled, as they were less positive than with the other methods.

In answer to question 10 regarding which would be the preferred future method (or methods) for feedback following summative assessments ten students referred to the use of a variety of methods in tandem, as they had appreciated different aspects of different methods.

There were, however, three students who didn't wish to incorporate any of the new trialled methods but would rather return to the method that was employed prior to the intervention.

When asked whether their opinion on feedback had changed following the intervention that had taken place, two students gave a blunt response of 'no' with no clarifying comment. Five students acknowledged that they appreciated there was a greater variety to the way feedback can be delivered than they had previously thought, and seven students indicated that feedback should still be providing them with ways to improve or identifying their areas of weakness.

Summary of Findings

A summary of the findings is now provided in response to each of the research questions.

1. How do students perceive the feedback they currently receive following in-class summative assessment?

The quantitative data from the first questionnaire indicates a positive opinion of the feedback that students normally receive following a summative assessment. Students were aware that they do receive feedback and when asked to clarify what feedback was only a small number referred to marks or grades, a greater proportion referred to the teacher expressing an opinion or advice to them. In written comments provided with the questionnaire students were clear that they found the feedback they receive to be motivating and that it helps them progress in the subject. This was highlighted by several comments that referred to them being able to 'improve' from where they currently are as mistakes and misconceptions had been identified.

2. What are students' views when different methods of feedback are employed?

Whilst undertaking this project myself and my colleague both noted that the students were interested and engaged with the research that was taking place. They would be asking about the

methods we would be using and when another feedback trial would be taking place and they spent considerable time considering their answers and filling in the questionnaires.

The questionnaires completed after each trialled feedback and post-intervention show that verbal feedback was the most favoured by the students, although it did take up considerable class time. In comments it was clear that the students had appreciated the personal aspect of this feedback and the ability to ask tailored questions privately to enhance their understanding. This agrees with the work of Mulliner and Tucker (2017) and Van der Schaff et al. (2013) who also found the verbal feedback was most favoured.

Comment only was the least favoured, this may be due to the students' feeling that they did not get enough input or explanation from the teacher with this method, especially if the students view the teacher as the expert (Nicol and Macrfarlane-Dick, 2006). Another reason for this being the least favoured is the removal of marks and grades. Whilst only a small percentage of students had identified this as being the meaning of feedback in the pre-intervention questionnaire, a much higher percentage then asked for it to be reinstated once removed after this feedback trial. Students in this class have become familiar with grades being provided following a summative test, not just in this subject. Through this regular use of grading the teacher had told the student that this is an important aspect of the assessment and the feedback received making the grading part of their achievement goals (Ames, 1992; Brookhart, 1997; Brookhart & Durkin, 2003; Harlen & Crick, 2003).

Self-marking was also received positively, although not as much as the verbal feedback. Students got to spend a considerable amount of time with their test paper, looking through their responses and comparing them to the mark scheme to identify mistakes and make necessary corrections. This allowed the students time to reflect honestly on their own academic performance which is important for their future learning (Black and Wiliam, 1998a). They had to be honest with themselves about the mistakes they had made and their current understanding of

the material. It also allowed them increased time to act upon the feedback, as they were working through the paper at their own pace, making the task formative and the students active participants (Nicol and Macfarlane-Dick, 2006). During these lessons there were a lot of questions from students who were struggling to interpret the mark scheme, and this was a common theme in the questionnaire responses. Students requested some extra explanation from the teacher on the mark scheme to aide their interpretation, and this is a skill they would need to develop over time. Students were surprisingly accurate in their marking, with most students within 1 or 2 marks of the score assigned by the teacher to the same test, often the students had marked lower than the teacher, so had been harsher on themselves.

In the post-intervention questionnaire students were more positive about feedback following summative assessments supporting their learning and progress than prior to the intervention. There was little change in how motivating they found the feedback, and this may well be due to the negative responses seen to the comment only feedback. Students were also less certain that all summative assessment should be marked by the teacher, likely due to the positive experience a large proportion of them had with the self-assessment.

Following the intervention students were keen to continue with the use of different methods or to see the trial extended. Both myself and my colleague had similar conversations with the students regarding them wanting to try methods again, or perhaps other alternatives moving forwards. This shows that students had been more engaged with the feedback process and that the trials had been a positive experience for them and they were wanting to continue learning about feedback methods, experiencing different approaches and see what might work best for them moving forwards.

3. How can teacher's feedback be improved?

When discussing our in-class observations both myself and my colleague noted that students were keen to try the methods again in the future or some variations thereof. They were asking both of

us about this in class and wondering if we could do more trials in the next academic year. They seemed to be interested in the project and the role feedback was playing in their learning and progression and wanting to improve this for themselves and for other students. The students wanted more opportunities to express their opinions.

Pre-intervention students wanted teacher feedback to be more personal. There were also requests for additional work to be set on similar topics to those that students had struggled with on the test. Following the verbal feedback trial there were again requests for additional work to be set along with some students asking for written comments alongside the verbal as they feared they may forget the conversation. Some students had commented on the questionnaire or in person during the lessons about the verbal method taking up considerable time and wondering when it would be their turn for feedback. Verbal feedback occupying a large amount of time is also mentioned in literature (Mulliner & Tucker, 2017) and can be a hindrance to its implementation.

Following comment only marking the most common suggestion for improvement was for the inclusion of a mark or grade. With self-marking there were requests for some extra guidance from the teacher on how to interpret and understand the mark scheme.

In the post-intervention questionnaire, the individual verbal feedback was the most requested as a method to be kept and incorporated into future feedback sessions. Most of the students had referred to the use of a variety of methods in future for their feedback. This shows that students had appreciated at least certain aspects of each of the feedback methods and could see how incorporating them in the future could be beneficial to them. This agrees with the literature as there was no consensus on the best approach to feedback, different studies had come to different conclusions as to which feedback method was most effective (Bloxham and Campbell, 2010; Havnes et al., 2012; Price et al., 2011; Mulliner and Tucker, 2017).

Discussion

To return to the research questions identified earlier in this project I found that the students involved in this research project already possessed a positive view of the feedback they were regularly receiving in their physics lessons, contrasting with the findings of Agbayahoun (2016). They saw it as being important to the progression of their learning (Gamlen & Smith, 2013), a view shared by students in the work of Doan (2013). Students considered the feedback they received after a summative assessment to be motivating and there was repeated mention of the teacher's opinion being the focus of what students were looking for when receiving this feedback. This ties with the literature which identifies feedback as being a process of communication between student and teacher (Black & Wiliam, 1998a; Leahy et al.,2005), with students' viewing the teachers as the experts (Nicol & Macfarlane-Dick, 2006) explaining why they referred to the teacher's opinion being the nature of feedback in the pre-intervention questionnaires. This view of the teacher as the expert would also explain the strong opinions held by my students that all summative assessments should be marked by a teacher. They are relying heavily on the teacher's input to present the path to improvement (Weeden et al., 2002).

Surprisingly in the pre-intervention questionnaires my students made very little reference to grades when receiving feedback, despite the prevalence of grading in literature when researching feedback. This disagreed with Butt (2010) who said there can be a tendency to overstate the importance of grading, something that I know the systems in my school can do, but that the students themselves had not identified. It is possible that this were not at the forefront of their minds as it had been a few months since they had completed a summative assessment in class due to school being closed by the COVID-19 pandemic. Had they completed assessments more recently and received feedback from these it is possible that grading would have been more readily identified as a part of feedback by the students.

There were mixed opinions on the different feedback methods that were trialled as part of this project, with verbal feedback being the most favourably received. This finding agreed with the studies of Mulliner and Tucker (2017) and van der Schaff et al. (2013) but disagreed with the work of Butler (1987) who found comment only marking to have the most positive impact upon students. My students were the least positive about comment only marking out of the three trialled methods. In comments they had written students had identified that the grades helped them to establish how well they had understood that topic compared with others. This agrees with the work of Peterson and Irving (2008) in that students do find grades useful for providing information on their progress in a subject. It is possible that due to the absence of assessments for some months my students did not have grades at the forefront of their minds before the intervention, but when they were removed, they were then reminded of the importance they place on them in.

With comment only marking there was a lot more written on the exam papers for the students to read and digest. Some students found this amount of red pen to be initially overwhelming, giving them a feeling that all the paper was wrong. Avoiding writing in red pen on a student's work is something that has been highlighted by Black et al. (2003) and were comment only marking to be implemented longer term there would need to be consideration given as to how the comments were to be presented to the students.

Another reason why comment only marking was not viewed favourably by the students, may be the method of implementation. This was a quick and sudden implementation of comment only marking, as necessitated by the nature of the trial and the time available. This was in contradiction to Black et al. (2002), who said that assessment and feedback practices that are gradually implemented are more likely to succeed. This opinion was also expressed by Heitnik et al. (2016) who said that poor implementation of feedback methods can lead to them being unsuccessful. It would be interesting to apply comment only marking over a longer period to see

if students would view it more favourably once they were more familiar with the approach. The setting of targets in conjunction with the comment only marking is something that could be trialled as Kennedy et al. (2008) highlighted that this would allow students to better see how to further improve.

After conducting a self-assessment of their performance on a summative assessment the students had responded positively to the experience, although not as positive as with the verbal feedback. This process resulted in excellent student engagement as they spent considerable time reviewing their papers, making corrections, and asking the teacher questions about things they had not fully understood. This gave the students opportunity to honestly reflect on their own academic performance, the importance of which was highlighted by Black and Wiliam (1998a) as well as ensuring that the students were active participants in their own learning and the formative aspect of the assessment (Elwood & Murphy, 2015; Wiliam, 2011). The use of self-assessment is helping to progress the responsibility for future learning from teacher to students (Black & Harrison, 2001). By self-assessing the students are having to think (Leahy et al., 2005) during this feedback process, working towards the ultimate goal (Tanner & Jones, 2003) of students being able to self-regulate their own learning.

During the research project students were very engaged with the process of receiving feedback and reflecting on this, there were insightful questions asked in class and students were keen to share their opinions with each other and their teachers. There was no definitive path for the improvement of future feedback, rather the students expressed the desire for a mixed approach, incorporating a variety of the techniques that had been trialled. A mixed methods approach to feedback can work, Purcell (2017) highlighted that the feedback type is not important if it purposefully connects with the students and encourages them towards their goal. This was verified by the work of Price et al. (2011), who demonstrated that a variety of feedback methods is appreciated by students otherwise engagement can be lost. It has also been demonstrated that

a combination of feedback techniques can have a greater impact that one method used alone (Van der Schaff et al., 2003).

Conclusion

The role of assessment within education is one that is not diminishing. Despite the cancellation of exams over the last two years due to disruption caused by COVID-19 there has been little real discussion regarding longer term changes to high stakes assessments, even with the opportunity for change presented by their cancellation. Instead, there has been even greater pressure placed on teachers to both create and analyse assessment data. Classroom assessment in the formative context can sit difficulty alongside the judgment driven high-stakes assessments that pupils are exposed to.

It is my hope that both myself and the Physics department can employ low-stakes summative assessments in a manner that empowers students to take ownership and responsibility for their own learning. For them to feel positively about assessments and encourage a view of assessment as something that can be motivating. It is through the careful consideration and delivery of feedback that I hope this can be achieved.

The next steps following this project were originally to use the data gathered on students views to improve the department's marking policy to include more formative and empowering feedback. However, following on from this research project it was evident that the students still had a lot more opinions to share. As such, the evidence gathered from this research will be used at a departmental INSET at the start of the next academic year to discuss our policies, but this project will then be extended. The research can be repeated with the new Y12 intake to increase the data set, whilst the Y12 students who have moved to Y13 can continue to trial different combinations of feedback. I would also like to conduct individual or small group interviews with

students to gather more data on their views than can be discerned from a questionnaire. I would also like to trial some feedback methods with the younger groups to see if the opinions are shared across the age groups or if the methods are perceived differently by the younger students.

By extending the research to involve more students this will also increase collaboration between teachers within the physics department. The involvement of more classes will necessitate more teachers to participate in the trialling of different feedback methods. Training in the delivery of feedback will encourage professional development, stimulate conversations and the sharing of best practice between colleagues. Whilst collaboration was an important part of this research project it was limited in participants and for the entire department to see the benefits of improved feedback more teachers will need to be involved for wider implementation of theory.

Through this project I have personally gained a greater understanding of assessment and feedback theory as well as being provided the opportunity to reflect on my own practices and habits in relation to assessment and feedback. I have discovered that feedback is a powerful tool with the scope to change a student's entire perspective on both a subject and themselves as a learner. I hope to continue to work towards delivering empowering feedback that supports students to become self-reflective learners who can monitor their own progress and identify their future needs to further progress.

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Appendix 1: CUREC Approval

Dear XXXX

TITLE: Assessment and Feedback: The views held by Y12 pupils of teacher feedback following summative assessment

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

Should there be any subsequent changes to the project which raise ethical issues not covered in the original application you should submit details to research.office@education.ox.ac.uk for consideration.

Good luck with your research study.

Best wishes
Nicola

Dr Nicola Warren-Lee
Geography PGCE Curriculum Tutor

University of Oxford/Department of Education
15 Norham Gardens, Oxford, OX2 6PY

Appendix 2: Information to read aloud to participants

The purpose of this research is to investigate student opinions of the feedback they receive following a summative assessment (topic test) and the engagement with feedback these methods promote.

The intervention will take place in the form of several different methods of feedback being used in class after the completion of a summative assessment. To assess the impact of this intervention questionnaires will be carried out with all participants before, during and after the intervention.

The data collected from this research will only be accessible to myself and my university supervisor. The data gathered will only be used for the purposes of analysing student opinions of and engagement with different methods of feedback.

You can withdraw yourself from this research at any time and all answers to questionnaires will be anonymised for analysis and discussion.

Appendix 3: Written Consent for Questionnaires

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44 (0)1865 274024 Fax: +44 (0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Assessment and Feedback: the views held by Y12 pupils if teacher feedback following summative assessment

PARTICIPANT INFORMATION SHEET

Central University Research Ethics Committee (CUREC) Approval Reference: **ED-CIA-20-157**

1. ***Why is this research being conducted?***

   This research is being conducted to investigate pupil opinions of different methods of feedback following a summative assessment.

2. ***Why have I been invited to take part?***

   You have been invited because you are in year 12, the school year at the focus of the study, and you are in a class taught by the individual (myself) undertaking the research.

3. ***Do I have to take part?***

   No. You can ask questions about the research before deciding whether or not to take part. If you do agree to take part, you may withdraw yourself from the study, without giving a reason, and without negative consequences, by advising me of this decision. The deadline by which you can withdraw any information you have contributed to the research is Friday 11th September 2020. Any data collected up to this point will be destroyed and not included in the research.

4. ***What will happen to me if I take part in the research?***

   You will be invited to complete a pre-intervention questionnaire, and possibly an interview. This will then be followed by a questionnaire after each different method of feedback is trialled and finally there will be a questionnaire and possibly an interview at the end of the intervention period. If you are still happy to take part, I will ask you to sign a consent form prior to you completing the first questionnaire.

   If you are happy to take part in the research, you may be selected to be interviewed outside of lesson time. The interview should take approximately 15 minutes. You can ask to pause or stop the interview at any time. With your consent, I would like to audio record you so I can have an accurate record of your thoughts.

5. ***Are there any potential risks in taking part?***

The following risks are involved in taking part: breach of confidentiality.

To reduce any potential risks, personal data will be anonymised.

6. ***Are there any benefits in taking part?***

There will be no direct or personal benefit to you from taking part in this research.

7. ***What happens to the data provided?***

The information you provide during the study is the **research data**. Any research data from which you can be identified (e.g. name, audio recording) is known as **personal data**.

Personal data will be stored on an encrypted external hard drive until the 30th September 2020.

Other research data (including consent forms) will be stored for at least [3] years after publication or public release of the work of the research.

The researcher and supervisor will have access to the research data. Responsible members of the University of Oxford may be given access to data for monitoring and/or audit of the research.

I would like your permission to use direct quotes anonymously in any research outputs.

8. ***Will the research be published?***

The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

The research will be written up as a student's thesis. On successful submission of the thesis, it may be deposited both in print and online in the University archives to facilitate its use in future research. If so, the thesis will be openly accessible.

9. ***Who has reviewed this study?***

This study has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee ED-CIA-20-157.

10. ***Who do I contact if I have a concern about the study or I wish to complain?***

    If you have a concern about any aspect of this study, please contact Sibel Erduran sibel.erduran@education.ox.ac.uk, and we will do our best to answer your query. We will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

11. ***Data Protection***

    The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the study.
    The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest.
    Further information about your rights with respect to your personal data is available from http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/individualrights/.

12. ***Further Information and Contact Details***

    If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

    XXXXXXXXXXX

    Department of Education
    15 Norham Gardens, Oxford OX2 6PY
    Tel: +44 (0)1865 274024 Fax: +44 (0)1865 274027

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PARTICIPANT CONSENT FORM

Central University Research Ethics Committee (CUREC) Approval Reference: ED-CIA-20-157

Assessment and Feedback: the views held by Y12 pupils if teacher feedback following summative assessment

Purpose of Study: To investigate pupil opinions of different methods of feedback following a summative assessment

		Please initial each box
1	I confirm that I have read and understand the information sheet version for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or penalty.	☐
3	I understand that research data collected during the study may be looked at by authorised people outside the research team. I give permission for these individuals to access my data.	☐
4	I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.	☐
5	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	☐
6	I understand how this research will be written up and published.	☐
7	I understand how to raise a concern or make a complaint.	☐
8	I consent to being audio recorded.	☐
9	I understand how audio recordings will be used in research outputs.	☐
10	I agree to the use of anonymised quotes in research outputs	☐
11	I agree to take part in the study	☐

_____	dd / mm / yyyy	_____
Name of Participant	Date	Signature
_____	dd / mm / yyyy	_____
Name of person taking consent	Date	Signature

Appendix 4: Pre-Intervention Questionnaire

Please complete this form with as much honesty and detail as possible. Where there are multiple answers on a scale, only circle one answer.

1. Do you receive feedback following a summative assessment?

Always	Sometimes	I do not know	Rarely	Never
1	2	3	4	5

2. What do you classify as feedback? Can you give me an example please?

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……

3. I think feedback allows me to progress in Physics.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

4. I think feedback supports my Physics learning.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

5. I find the feedback I receive following a summative assessment to be encouraging.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

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……

6. I find the feedback I receive following a summative assessment to be demotivating.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

……

……

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……

7. All summative assessments should be marked by a teacher.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

8. How often do you apply the feedback you receive following summative assessments to future pieces of work?

Always	Sometimes	I do not know	Rarely	Never
1	2	3	4	5

9. Feedback from summative assessments is received within a time frame that is beneficial to me.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Complete the following sentences:

10. Feedback from summative assessments is…

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11. Feedback from summative assessments could be improved by…

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Appendix 5: Questionnaire following a trialled feedback method

Please complete this form with as much honesty and detail as possible. Where there are multiple answers on a scale, only circle one answer.

Method of feedback: _____

1. This feedback allows me to progress in Physics.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

……

……

……

……

2. This feedback supports my Physics learning.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

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3. I find this feedback encouraging.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

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4. I find this feedback to be demotivating.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

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Complete the following sentence:

5. This feedback could be improved by…

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Appendix 6: Post-Intervention Questionnaire

Please complete this form with as much honesty and detail as possible. Where there are multiple answers on a scale, only circle one answer.

1. What do you classify as feedback? Can you give me an example please?

   ……

   ……

   ……

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   ……

2. I think feedback allows me to progress in Physics.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

3. I think feedback supports my Physics learning.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

4. Which method of feedback did you find the most useful for future progression in your Physics studies? (**tick one answer**)

Comment only	Verbal	Self-assessment

5. I find the feedback I receive following a summative assessment to be encouraging.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

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6. I find the feedback I receive following a summative assessment to be demotivating.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

Please explain:

……

……

……

……

7. All summative assessments should be marked by a teacher.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

8. How often do you apply the feedback you receive following summative assessments to future pieces of work?

Always	Sometimes	I do not know	Rarely	Never
1	2	3	4	5

9. Feedback from summative assessments is received within a time frame that is beneficial to me.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
1	2	3	4	5

10. In future what would be your preferred method (or methods) of received feedback following a summative assessment? Please explain your answer.

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11. Has your opinion on feedback changed? Why / Why not?

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