Feedback for Learning

By John Orlando, Ph.D.

A Magna Publications White Paper

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ABOUT THIS WHITE PAPER

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1 Teaching as Feedback

"We spend too much time on teaching, and give too little feedback."
Grant Wiggins

The problem with lectures

Aristotle was wrong. He believed that students learned from a lecture, because the goal of education for Aristotle was to transfer the knowledge from the head of the teacher to the head of the student. The teacher's knowledge was put into words and sent orally to students, who then made a copy of that knowledge in their own heads. Teaching, for Aristotle, was akin to transferring water between vases or, as we might say today, transferring information between databases. Assessment in this model is a matter of measuring how accurately the copy in the student's head matched the original in the teacher's head.

But we now know that learning is not like that. Knowledge is not transferred from knower to learner, but rather constructed by the learner though a combination of external cues and internal reflection. Learners begin with a prior knowledge base, get external cues in the form of observations, text, images, and the like, compare those cues to their knowledge base, reflect on the difference, and revise their knowledge base in light of the result. The student is more a carpenter constantly remodeling their knowledge home than a database passively filling with whatever new data is sent to it.

Unfortunately, higher education fundamentally embraced the lecture model of teaching. But study after study has proven that the lecture is not an effective way of learning. A University of Maryland study found that right after a physics lecture, almost none of the students could answer the question "What was the lecture you just heard about?" Another physics professor simply asked students about the material that he had presented only 15 minutes earlier, and he found that only 10 percent showed any sign of remembering it (Freedman, 2012).

Worse yet, the printing press made the traditional lecture obsolete nearly 800 years ago. At one time, the university was a storehouse of knowledge that could only be accessed by those attending it and listening to the words of the teachers. But no more. Anything that a faculty member says is available in some form in some place. YouTube, iTunesU, and MOOCs have put the final nails into the lecture coffin by making even the visual element available anywhere, at any time, for free.

Feedback as the most important factor in learning

Does this make faculty obsolete? Not quite. While faculty tend to be focused on curricular issues—what they will teach and how they will teach it—studies have repeatedly shown that feedback has a far larger influence on learning. John Hattie (2009) synthesized over 800 meta-analyses, involving a remarkable 180,000 studies on 20–30 million children that looked at over 100 factors that influence student achievement. Differences in "programmed instruction"—that is, curriculum—had almost no effect on learning. Faculty toil over what they will put into their lectures, but the

evidence indicates that they might as well just videotape any of their colleague's lectures and put that online. There is not likely to be any significant difference in learning outcomes between any two, three, or five lectures on a topic.

The real difference in learning comes through feedback. The table below ranked the effects in order of highest to lowest, with an average effect size of .40. Feedback as a whole came out near the top with an effect size of .95, while influences such as praise and programmed instruction came out at the bottom. We will examine these factors as we explore different types of feedback in this work.

TABLE 2
Summary of effect sizes relating to feedback effects

Variable	Number of meta-analyses	Number of studies	Number of effects	Effect size
Cues	3	89	129	1.10
Feedback	74	4,157	5,755	0.95
Reinforcement	1	19	19	0.94
Video or audio feedback	1	91	715	0.64
Computer-assisted instructional feedback	4	161	129	0.52
Goals and feedback	8	640	121	0.46
Student evaluation feedback	3	100	61	0.42
Corrective feedback	25	1,149	1,040	0.37
Delayed versus immediate	5	178	83	0.34
Reward	3	223	508	0.31
Immediate versus delayed	8	398	167	0.24
Punishment	1	89	210	0.20
Praise	11	388	4,410	0.14
Programmed instruction	1	40	23	–0.04

It turns out that Socrates was right all along. Socrates fundamentally believed in teaching through feedback. He rarely gave the student any answers. Instead, he would initiate a conversation with a question prompt, get an answer from the student, and provide feedback on that answer. This would cause the student to reflect on his or her beliefs, adjust them in light of that reflection, and provide a new answer, which would lead to more feedback, more reflection, and so on. The student learned through reflection guided by feedback.

The instructor's job in this model is to initiate the reflection that leads to construction of new knowledge. Each student's journey to understanding is unique, because each student begins at a different location and must follow their own path to understanding. In this way, education is tailored to the student; it can never be mass-produced through a large lecture.

This is good news for faculty, since it means that any fears that MOOCs, YouTube, or online education will make them obsolete are unfounded. The real value of a faculty member is not in the knowledge in his or her head, but in the relationship they establish with their students. At the heart of this relationship is the feedback that they provide. The teaching craft is the ability to diagnose a student's barriers to understanding or performance, and provide them with feedback that will lead them to the solution. Faculty who focus on providing quality feedback to students can never be replaced by MOOCs, YouTube, or online courses.

We will examine why most feedback fails and provide a feedback model that teachers can use to vastly improve student understanding and performance.

2 The Feedback Failure

Poor feedback

Consider the following examples of common feedback:

"Good job"

"Vague"

"Grammar"

Do they look familiar? Students are used to getting the bulk of their feedback as these sorts of "margin comments" running down the side of their papers. Unfortunately, such comments are of almost no value to the student, because he or she does not understand them. All the examples above lack sufficient detail to be of help to the student. For feedback to have value, the student needs to be able to see what they did well or poorly in their work, and how to do better the next time around. But the examples above do none of that.

A student who reads "good job" does not know what was good about their job, and thus what should be repeated the next time. Was the writing good, and if so, was it the spelling, grammar, or sentence structure that got the praise? Maybe the organization of the work was good, and so should be repeated next time. Perhaps it was the ideas that were good, and so the student should focus on critical thinking in their work. The student is given nothing with "good job" that can guide them to repeating the performance next time, or to building on it. The student might even pick the wrong thing as good and start repeating something that is not good, leaving the instructor to wonder why the student's performance has gone down.

The same holds true with statements like "vague." Ironically, it is the feedback itself that is vague. The student does not know what is vague about what they said. After all, it was not vague to them. They knew what they meant, so why didn't the teacher? They may even decide that it must be vague to the teacher because the teacher did not read it carefully. The student does not know what they did wrong, or how to fix it.

Some instructors will circle writing errors and note "grammar" or "spelling" in the margin in order to send the student looking for the problem to fix it. But thinking that students will put time and effort into running down the error later, let alone even remember it by the end of the paper, is naive. The student who sees a comment like this, especially if it is part of a long list of writing comments, is simply going to ignore the feedback and move on.

Justifying the grade

Why do faculty provide this sort of feedback? The answer is usually due to a fundamental mistake about the purpose of feedback itself, which is the view that the purpose of feedback is to justify the grade.

Instructors tend to view student work through the prism of grades. After all, we call the process of reading a student's work "grading." We don't tell our spouses that we "need to spend the evening providing students with feedback on their work," or that we're "spending the evening helping students improve their performance." We say that "I'm spending the evening grading," usually followed by a long, arduous sigh.

As a result, instructors tend to read a student's work with a mind toward calculating the grade. The instructor simply goes through the work, mentally checking off the errors and noting them in the margins. The comments become no more than a means to justify the grade. The instructor thinks that since the student lost a bunch of points on writing, then they have to mark down a bunch of grammar mistakes to justify that deduction. Feedback of this sort is just a running count of grade additions and deductions.

While grades are a necessary evil of teaching, they should not be the focus of feedback.

More important, there is quite a bit of evidence that grades actually harm student performance. First, grades tend to diminish a student's interest in learning (Kohn, 2011). They become focused on the reward rather than learning. Grades also reduce students' motivation to take risks that might lead to higher achievement, because risk-taking could also lead to greater failure. What is most interesting is that grades, like all external rewards, actually reduce the quality of thinking. Daniel Pink has noted that study after study shows that by offering someone an external reward, such as money or grades, you will actually lower performance on complex tasks (such as writing college papers).

While grades are a necessary evil of teaching, they should not be the focus of feedback. The "justifying the grade" approach only reinforces in the student's mind that the grade is the goal of the assignment, rather than learning. Many faculty complain that students are overly focused on grades, yet they encourage this mentality when they only give feedback in the service of grades. Faculty who want students to get past their fixation on grades, and want to see student performance improve, need to stop suggesting through their feedback that grades are the point of education.

The most important thing that faculty can do is to conceptually distinguish grading from feedback. Grades are backward-facing because they are an evaluation of past performance. Feedback should be forward-facing because it is intended to improve future performance. Feedback and grading

have fundamentally different purposes and orientations, and divorcing grading from feedback is a critical change in mindset for an instructor that will vastly improve his or her teaching.

One helpful device for separating grading from feedback is to think like a coach. Coaching is an excellent model for teaching because coaching is fundamentally a form of teaching. A coach's job is to teach a player how to do something, such as hit a baseball and work with a player until they are able to do that thing well. Thus, the best coaches are the best teachers.

Importantly, coaching is done primarily through feedback. A coach spends very little time, if any, grading a player. A coach also spends very little time lecturing to his or her players. Most of a coach's time is spent watching a player perform and providing feedback on that performance. The coaching craft is fundamentally about diagnosing player problems and providing feedback that the player will understand and use to improve their performance.

One helpful device for separating grading from feedback is to think like a coach.

In this way, coaching is fundamentally performance-oriented. Someone is not known as a good coach because they are a good grader. They are a good coach because they are good at improving player performance. Improving student performance should also be the goal of teaching, and we will return to the coaching metaphor at numerous places in this work to illustrate points, because it provides a powerful reminder of the purpose of teaching and feedback itself, as well as the methods that best improve performance.

3 Feedback That Works

Types of feedback

Research into learning has identified three types of feedback: feedback, feed forward, and feed up (Brookhart, 2008; Fisher and Frey, 2009; Hattie and Timperly, 2007). Feedback proper is commentary on a person's work. Basically, feedback refers to what was done well or poorly. Importantly, feedback is backward-facing in that it concerns a performance in the past. **Feed forward** is information on how someone can improve their performance in the future. This is forward-looking advice on what path to take to fix problems and increase achievement in the future. Finally, **feed up** is information on why an activity, such as an assignment, is important. Feed up answers the question "What's in it for me?" in that it demonstrates the value of an activity for moving someone closer to their ultimate goal. We will look at each in turn.

Feedback

Wiggins (2012) adopts a fairly narrow definition of feedback as "information on how we are doing in our efforts to reach a goal." A simple example is the feedback that a coach might give to a batter:

> *You connected on 25 or 50 pitches. Most of the pitches you missed came when you dropped your back elbow. When you raised your back elbow, you nearly always hit the ball.*

Notice how the batter is getting straightforward information on their performance. This is not advice. The coach did not say "Raise your back elbow," although the batter might infer that raising it would be a good idea. This is also not praise. The coach did not say "Good job today." It is also not a grade. Wiggins does not consider grades a form of feedback per se because they are not descriptive; they are an evaluation. For Wiggins, feedback is fairly objective in that it concerns what someone observed about a performance.

Feedback does not always have to be expressed explicitly. A teacher who sees glazed-over looks on the faces of his students is getting feedback on how his lecture is being received. I might also see that a friend laughed at my joke, providing me with feedback that the joke was funny to him.

It is important to conceptually separate feedback proper from related concepts such as advice, evaluation, or praise. While these concepts are important, and we will discuss them when we address feed forward, it is important to note that feedback in itself provides quite a bit of information for improving performance. Wiggins points out that I can provide effective feedback to a colleague who is teaching a class by simply saying that "I counted half of the students texting during your class today." The colleague can use the information to make his own inferences about why the students were texting, and what might be done about it. The colleague can use the feedback to think about what he was doing for the class, and he can try something different next time. If he is lucky enough to have me back in class next time to observe the student reactions, he can gain feedback on whether what he did increased or decreased texting. I have done nothing to suggest one course of action over another. I only relayed what I observed. I also didn't say

anything evaluative about whether having half the students texting is a bad number. Maybe half the students are texting in most classes. Maybe it is even a low number compared to most classes, and a sign that he is doing better than most at keeping students' attention.

Note how the mere objective observation of the students' texting provided valuable information to the colleague. Wiggins claims that instructors tend to provide far too little feedback, instead devoting their time to advice, evaluations, and so on. He believes that with adequate feedback, students will generally see the path to fixing their problems on their own. While this last claim might be debated, and Wiggens certainly acknowledges the importance of advice and guidance, the underlying point is that feedback should form the heart of an instructor's commentary to a student, and that the first goal of an instructor should be to improve their explanations of what the student did wrong in their work. This starting point already gets the student halfway to the solution.

With this in mind, researchers have identified a number of principles to follow for effective feedback:

Goal-oriented

Our actions are generally goal-oriented—a batter has the goal of hitting the ball; a student has the goal of completing the assignment. It is important to connect feedback to that goal in order to make it relevant. If the assignment requires that the student do a 15-minute class presentation on how bond rates are determined, then the goal of the exercise is to bring the students in the class to that understanding, and the feedback needs to be referenced to that goal. The instructor might tell the student that:

> *The goal of your exercise was to teach your fellow classmates how bond rates are determined. To that end, you succeeded in teaching them the distinction between bonds and ordinary stocks. This is an important first step toward understanding the concepts. But they did not gain a complete understanding of the role that the market plays in determining bond rates...*

The instructor might then go on to point out which elements of the student's talk were clear because the class understood them, and which were not clear because the class did not understand them. The instructor might also say that the visuals either did or did not help the students understand the material. All this feedback is given in terms of the goal of producing understanding among the students. By couching the feedback in terms of that goal, rather than more evaluative concepts like what the teacher liked about the activity, the student is able to discern how far along they got toward the goal, much like a batter who knows from the fact that they hit 50 percent of the balls pitched to them how far along they got toward the goal of hitting all of the pitches.

Every assignment has specific objectives, and the short-term goal is to fulfill those objectives. It is easy to forget those goals and simply grade whatever is put before you. But if the point of the assignment is to learn about informed consent in medical decisions, then whether the student has

done that should be the primary focus of feedback. It is easy to get sidetracked into minor writing issues when teaching writing is not the primary objective of the assignment.

That is why it is often beneficial to both student and instructor to begin feedback with a reminder about the assignment itself. This helps remind the student of the goal of the assignment and puts the feedback into that context. For instance, an instructor might start their feedback by saying that:

> *This assignment required you to do three things. First, explain the importance of honoring a patient's wishes concerning their treatment. Second, explain when a doctor may not want to honor those wishes. Third, provide directions that guide the doctor in deciding when to substitute their own judgment for the patient's judgment.*

The instructor needs to be clear on the standards of success and then state the feedback in relation to those standards.

The instructor can then provide feedback on whether the student reached each of those goals. The instructor might say that the first goal was fully satisfied, while the second and third were only partially satisfied. The instructor would then go into detail about what the student did toward satisfying the goals, and what was absent that caused the student to fall short of fully satisfying the goals. This means stating what the student did right and what the student did wrong or did not do.

Students also need to understand what success looks like. Too often, faculty will provide feedback such as "good job" or "I liked this," neither of which tells the student how their performance stands in relation to criteria for success. Was the job good enough, or not good enough, and what is the standard of a good job?

In a sports setting, the standard of success is normally fairly obvious. For a batter, it is hitting the ball. But in an academic setting, it is less obvious. The instructor needs to be clear on the standards of success and then state the feedback in relation to those standards.

For instance, the instructor might say "You answered this question fully because..., but you did not answer this question fully because...." This is information that shows the student where they stand in relation to the goal of the assignment, and what they need to work on to get closer to their goal.

Moreover, instructors need to provide feedback on where the student stands in relation to the goals of the course. Instructors might think that the grade is a running commentary on the student's standing in relation to course goals, but the goal of the course is not to get a high grade, but rather to acquire knowledge or skills. These objectives are usually laid out in the syllabus, but often ignored once the course has begun. But it is helpful to provide students with feedback on where

they stand in relation to achieving the goals of the course.

For instance, an instructor might say that:

> *One of the objectives of the course is to be able to organize your writing in a clear manner. You are doing a far better job now in organizing your essays than you were doing at the beginning of the course. Recall that at the beginning of the course, you had X problem. But now, you have gotten past that problem by doing Y. At this point, you need to improve Z in order to produce fully coherent and easy-to-understand work. This means working on the following areas....*

The student is thus able to reflect on where they stand in their learning, and be reminded that the goal is learning a skill, not earning a grade. The feedback will give them the sense of being on a trajectory of intellectual growth, and that they can see their progress along this path, which will motivate them to keep working at it.

Detailed

Imagine that a coach tells a soccer goalie that the other team keeps scoring on her because her technique is wrong, and then walks away. What would we think of this coach? Obviously, we would think that the coach is doing a terrible job because they are not providing the detail needed for the player to know what is wrong about her technique.

Unfortunately, this is precisely the sort of feedback that students tend to receive from instructors. Circling a grammatical error and writing "grammar" next to it is no different from telling a soccer player that "your technique is wrong" and walking away. We would not expect it from a coach, and we should not expect it from a teacher.

There are many ways in which someone's grammar can be wrong, just as there are many ways in which someone's blocking technique can be wrong. The coach knows which of those million ways is the problem and has no reason to keep that information from the player. The coach says:

> *You are missing your blocks because your technique is wrong. You hold your hands down by your side like this. As a result, you can't get them up fast enough for a high kick toward the corners. You need to instead hold them up like this, and keep your knees bent like this so that you can react quickly to the shot. Now you try it.*

Similarly, the instructor knows what the grammar error is—so why not say it, rather than keep the student guessing? If the student used the wrong form of "there," the instructor might say:

> *You used "they're" when you should have used "their." "They're" is a conjunction of "they" and "are," and so it is only used when it can be replaced with "they are." "Their" is possessive, which means that it tells you that something belongs to something or someone else. Because you were using the term to refer to Jim's house, which belongs to Jim, you should have used "their."*

Note how the instructor here explains the specific mistake to the student. Plus, if the student used the wrong form of the word, then they might not know what the right form is, and so that information is part of the feedback. Now the student understands exactly what they did wrong and has the understanding needed to avoid the error in the future.

Personal

It is also important that feedback be personal in that it focuses on the student's particular performance and problems. As faculty grade paper after paper, it is too easy to fall into the trap of looking for common errors and providing boilerplate comments on those errors. But we spend more money on a personal trainer than a group fitness class because we know that personal instruction is going to bring more improvement than common instruction. Similarly, students need feedback specific to their own problems.

A recent survey by Turnitin (2012) of nearly 900 college students asked them what they tend to get out of their instructor's feedback, and what they wanted. A major theme was that instructors do not provide enough personal feedback. They noted that even a grading rubric, which is better than a grade alone, did not provide much in the way of help. As one student put it, being told that they got "3 on a 4-point rubric" did not tell the student why they did not get the full 4.

Students need to be told specifically what they did wrong. To this end, students focused on the value of live meetings to provide the personal feedback on their work that they need. These live meetings allow the faculty member to focus on the student's unique issues and provide feedback that is tailored to the student's underlying problems.

Understandable

Consider the following feedback to a student:

> *Your discussion of Plato and Rousseau lacked critical analysis of their positions.*

The problem is that the student likely does not know what is meant by "critical analysis." After all, if the student knew, they would likely have included it. The student might be thinking, "But I did provide an analysis. I talked about both of their positions. Isn't this an analysis?"

Faculty often have a hard time putting themselves in the place of a struggling student. After all, they were once, presumably, one of the best students in their class, or they would not have gone to graduate school and received a PhD. Plus, they have years of writing experience behind them. They assume that students understand concepts like "critical analysis," whereas the student often does not. An instructor who uses these sorts of terms without explanation and example might as well be speaking in a foreign language. The instructor here needs to break down for the student what they mean by "critical analysis." If the student did not provide "critical analysis," then what analysis did they provide? Since it was not sufficient, what was missing, and what needed to be added to make up for the deficiency? The instructor might instead say:

Your discussion of Plato and Rousseau demonstrated an understanding of their different models of government—Plato's as authoritarian and Rousseau's as a democracy. But the assignment required that you add an analysis of the positions. This means discussing why they held them, what they mean, or the advantages and disadvantages of each. You stated that Plato thought little of the average person's intelligence, while Rousseau believed that the population could make the right decision in the aggregate. This is a good start. You should have then gone on to talk about how, for Plato, the purpose of a government is to get the best outcome for all, while for Rousseau, government was an expression of each citizen's autonomy and free choice to impose collective rules on themselves. This gets to the heart of the concept of right, which is fundamental to our modern democracy, and explains why we follow Rousseau over Plato today.

Now the student has a better idea of what an analysis would entail, and why their work did not constitute a full analysis. They can see what they should have added. This one example might not turn the student's work around entirely. It will likely take repeated examples of the student being told what they were missing. Eventually, the student will start abstracting from these examples an understanding of what an analysis is and will apply that to all future work.

Timely

It should go without saying that the sooner the feedback comes after a performance, the better. A batter who is told right after swinging at a ball that he is dropping his back elbow is going to learn far more quickly than one told the next week. In fact, timeliness of feedback is one of the central attractions of video games. The player who dies and needs to start over knows immediately that they did something wrong. They connect that feedback to the fact that they went up the stairs and will not do that again.

This is why video games are perhaps the most powerful learning device yet created. Any parent who watches their child play a video game cannot help but marvel at how quickly the child has mastered the moves and acquired an understanding of the rules. It is not as if children are born with a "video game" gene. The games are a perfect feedback mechanism because the feedback comes quickly enough to be connected to performance. In fact, no video game player worth their controller would dare read a new game's directions out of the box. They simply start playing and learn quickly through feedback.

Unfortunately, college students often do not receive feedback soon enough after their performance in order to learn from it. The abovementioned survey asked students how quickly they received feedback on their work. Remarkably, nearly half the students report that it typically takes over a week to receive feedback from their instructors. Below are the results:

How long does it typically take to receive feedback on your papers?	Response Percent
0-3 days	19.5%
4-7 days	29.7%
8-12 days	22.2%
13-16 days	10.9%
17+ days	17.7%

One student mentioned that he often did not get feedback until after he was well into future assignments, and so could not use it to correct that work. More important, once that feedback came, the assignment itself has fallen out of the student's memory. The performance is no longer "live" for the student, which greatly diminishes the value of the feedback.

Faculty who complain that they do not have enough time to provide quick feedback on students' work have a number of options. First, they can devote some of their class time to student feedback. One simple way to vastly improve the effectiveness of a lecture is to periodically stop to ask students a question that they can answer via a clicker or through their smartphones using a live polling system, such as Poll Everywhere. The instructor can look at the results, see how many students get it, and respond by addressing misunderstandings.

A second option is to use fellow students for feedback. Eric Mazur, a physics professor at Harvard, will stop about every 15 minutes to ask a question that requires students to apply a concept that was just covered in class (Hanford, 2013). A classic example (one that college students normally get wrong), is to ask the students to pick from a list the forces that are acting on a ball thrown straight up in the air just after it leaves the person's hand. The students first vote on what they take to be the right answer. Then they discuss their answer with their neighbor, with each explaining why they think that their answer is correct.

The process of discussion gives each student feedback on their reasoning. Students start arguing their position and convincing others to change their answer. A second vote is taken afterward that nearly always results in far more students getting the answer right. The instructor has provided students with both a way to immediately apply concepts learned in class and a way to get immediate feedback on how they apply those concepts, thus leading to far deeper understanding and better performance on assessment.

Feed forward

Recall that tasks are goal-oriented, and feedback should be given in relation to that goal. With this in mind, Hattie (2012) states that there should be three questions driving the instructor's feedback. The first question is "Where is the student going?" In a history class unit, the goal might be to understand the causes of the First World War. The second question, then, is "How is the student going?" Where is the student on his or her journey toward the goal? Do they understand some of the material, and if so, which parts? This is what comes out of assessment. Once the student's progress is determined, the final question is "Where to next?" What should the student do in order to get closer to the goal? The goal of feedback is always "to reduce the gap between where students are and where they should be," which means providing some guidance to the student on how to improve their performance. This guidance is called "feed forward." Below are some important principles for giving feed forward.

• Feedback before feed forward

It's a good idea to always use feedback first, followed by feed forward. The student needs to understand their problem before being given advice on how to fix it. Imagine that an instructor provides the following information to a student:

> *When comparing philosophers in future assignments, you should always examine the underlying factors that brought them to their positions.*

This is straightforward feed forward, or advice, but it leaves the student unsure of the problem. At best, the student could infer a deficiency, but this is not clear to them. It is always preferable to begin with feedback on the problem, and then follow it with feed forward on the solution. For instance, consider the following:

> *The assignment required you to use three academic resources. While you did use three magazines, these were not academic resources. It is important to always draw from academic sources because they are more reliable, and the validity of their statements can be evaluated.*
>
> *In the future, start your research in the university's library databases. These contain only scholarly resources. Plus, you can ask the librarians about other academic resources, such as Google Scholar, and their own books and periodicals. Follow the librarian's advice and you can't go wrong.*

Note how the commentary started with a clear statement of the problem in terms of how far the student got in the assignment. The assignment was to use three academic resources, and the student got the resources part, but not the academic part. This is the feedback part of the commentary. The instructor then went on to provide feed forward on how the student can address the problem in the future.

• Be specific

Imagine that an instructor provides the following commentary on a student's work:

Your bibliography was not in proper APA format. Read the APA manual to learn how to do it properly.

The first problem is that the instructor never stated the problem in clear terms. Just as with circling a word and writing "grammar" next to it, instructors should never send the student elsewhere to chase down the fundamental problem and solution, especially to a 200- or 300-page book in which the student must now search to find the right information to address their particular issue. The instructor has the student's attention right now while providing the feedback, and so now is the time to provide the information that the student needs. A far more effective approach would be the following:

Your bibliography was not in APA format. For one, you listed your resources chronologically, whereas bibliographies are organized alphabetically by the author's last name. You also put the title of the works in the wrong location; they need to go before their source.

Use the following format for a periodical:

Author, A. A., Author, B. B., & Author, C. C. (Year). Title of article. Title of Periodical, volume number (issue number), pages. http://dx.doi.org/xx.xxx/yyyy

Here is a link to the Purdue Owl site on APA formatting, an excellent resource for any citation questions: https://owl.english.purdue.edu/owl/resource/560/07/

Once again, the commentary started with a clear statement of the problem. The instructor then provided clear advice on how to do the assignment properly in the future. The student was not just sent to a general resource on APA formatting. The student has a specific problem with APA citation formats, and so the instructor should link the student to just that topic.

Faculty can save themselves a tremendous amount of time, and provide far better guidance to their students, by developing a "toolbox" of specific resources that connect to specific problems. This could be a spreadsheet organized by main issues, such as "grammar," "citations," and so on, followed by subtopics such as "there/their confusion," "footnote format," and so on, and then text that can be cut and pasted into students' work where needed.

To be clear, the toolbox is not meant to replace personalized feedback. The instructor must diagnose the student's unique problems and address those problems. The toolbox is more of a resource repository for specific, yet common, problems. This is especially helpful for writing issues. The toolbox commentary might start with a discussion of the different tenses of "there," followed by a link to a good resource. The instructor can then cut and paste that commentary into places where the confusion appears in students' work, rather than having to rebuild it every time it appears. The toolbox has both saved the instructor time and provided students with the detail they need to improve.

• **Process**

A former NFL quarterback with a middling career once said that his development was hampered by not having been taught how to watch game film. He sat in hour after hour of pregame meetings with coaches thinking that he was supposed to watch the opposing team's quarterback to learn from him. It was only after he retired that he was told that he should have been watching the opposing team's defense to learn their tendencies so that he could recognize and react to them on the field. Nobody had ever explained this to him. The coaches sitting next to him in the same room assumed that he was watching for the right things. Here, performance problems stemmed from a lack of understanding of the process that should lead up to that performance. Yet the coach was not teaching the process to the player, thus allowing the problems to persist.

Similarly, instructors do not simply have knowledge of their field, they also have process knowledge of how to read academic articles and prepare academic papers. Much of this comes from the experience of reading hundreds of articles, and some of it comes from their background understanding of core concepts in the field, which helps them place the work within the context of the field's major beliefs. It is easier for an instructor to read an academic work in their field than for a student to do so because the instructor has an eye for what is significant. They read a work thinking to themselves, "This is not what most people believe in the field. Let's see how well they defend it," or "This was proven 10 years ago; there's nothing new here." The student does not carry that understanding, and thus does not know what is important. They may read the work focusing on the wrong thing.

Very often the student's problems relate to the process of developing the work.

Thus, while instructors tend to focus their commentary on the assignment itself, very often the student's problems relate to the process of developing the work. For instance, students are often unsure about the steps to follow in creating their work. The development process is sometimes so obvious to a teacher that they think it is equally obvious to the student. But students often do not understand the basic steps that they should be following to produce a work. Problems with product are very often a result of problems with process.

For instance, a student in the Turnitin (2013) webcast stated that when he is given an assignment to read a primary text, along with secondary texts, and to write his thoughts, he does not know whether to start by reading the primary or the secondary texts. To an instructor, it might be obvious that you start with a primary text and then go to a secondary text, but it is not obvious to a student. As a result, the student did not know if he should first form an interpretation of the primary text, compare that to the interpretations from the secondary texts, and then defend his interpretation against the others, or read the secondary texts first to learn their interpretations of the text and use those as tools for interpreting the primary text. The result was that confusion about the process of developing the work led to problems in the work itself.

Another student talked about his chronic problem with unpacking his argument in a coherent way. He mentioned that the best feedback he received on this issue was from a teacher who told him that he was running through his argument too quickly. The teacher also said that he was trying too hard to write in a scholarly tone. The teacher advised him to slow down his writing, and to stop every once in a while to ask if someone with a college-level understanding of English, but no technical knowledge, could understand what he was saying. If not, then he should translate any technical lingo into plain, everyday English in order to prove that he understood the concepts. This would also slow down the pace at which he unwound his thoughts.

Too often, faculty assume that students who have missed important information in an article were careless in their reading or writing. But the student might simply not know how to read an article for important information. We are not born with this skill; it must be developed, and some people may not have developed it sufficiently to know how to read dense academic articles.

When a student has trouble reading an article, a good starting point is for the instructor to talk about how they themselves read an article. For instance, an instructor can provide a sample article with the important points of each paragraph summarized in a margin comment. This will demonstrate how to read for general, or underlying, themes, rather than simple facts.

An instructor can also talk about the process that they use to read an academic work. Many instructors skim an article first, looking for major themes, and then read in more detail later. If so, the instructor can walk through the process of reading an academic article in class. Faculty feel that they need to spend all of their class time on content issues, but a small amount of time on process issues can make a world of difference to students—not only in that class, but in all of their future study.

Another important process topic is how to take notes on an article. An instructor might discuss how they highlight relevant passages using the highlighting functions in MS Word or on PDFs using Adobe Reader, and then make a comment on the highlighted text using the commenting function. Sometimes these comments are quick summaries that allow the instructor to find the passage quickly later. Sometimes these are objections to the author's claims. Sometimes these are thoughts as to how the claim is relevant, or connected to other beliefs within the field.

The writing process is also an important topic for improving student performance. Advising the student to read their work out loud to see if they can hear any problems will draw their attention to grammar and sentence structure issues. Some people have a hard time seeing the writing issues in text, but they can hear them, and so this simple step will allow them to catch problems.

Thinking itself is a process that students need to be taught, especially in reference to problem-solving. A big difference between experts and novices lies in what experts do when they encounter a problem (National Research Council, 2000, p.18). Experts tend to have a process for moving forward. They might first state what they know, and then what they do not know. This tells them what information they need to find to solve the problem. Novices lack this thinking strategy.

An instructor can help with a student's thinking skills by asking "What did you do when you couldn't figure out Locke's position?" Having heard the student's response, the instructor can now provide strategies for working through the problem. Thinking strategies are among the most important skills that a teacher possesses, and it is likely that they played a major part in the teacher's own successes in intellectual development. Sharing these strategies with a student can be invaluable to fostering lifelong skills that sustain the student well beyond the class—which, after all, is the whole point of teaching.

• Modeling good work

When a piano instructor introduces a new piece to the student, the teacher does not just give the music sheet to the student, have them play it, and tell them what they did wrong. The instructor plays it first so that the student hears what the piece, played masterfully, should sound like before they start on their own. This is teaching through modeling.

If we want our students to grow, we need to model good work for them as part of our feedback.

We instinctively know that much of teaching is simply modeling. One method to become good at something is to find someone who is good at it and do what they do. Simply watching what the experts do and copying that is a big part of how we learn. An apprentice mostly watches how the master does it and copies that.

Yet, as instructors, we often forget this fundamental teaching principle. We focus our feedback on telling students what they did wrong without providing a model for doing it right. Worst yet, we might even think that we are somehow doing our students a favor by withholding this information and forcing them to figure it out on their own. If we want our students to grow, we need to model good work for them as part of our feedback.

Imagine that an assignment asks the student to do five different things.

1. Explain Plato's position.
2. Explain Aristotle's position.
3. Explain how the two positions are similar.
4. Explain how the two positions differ.
5. Defend one author's position over the other.

Now imagine that the student included elements 1, 2, and 5 in their work, but not elements 3 and 4. There are a variety of possible reasons for the omission. One is that the student read the assignment directions, wrote their work, and did not go back to check whether the final product matched the assignment directions. Another possibility is that they thought that they had hit all of the topics in the assignment, but because they did not follow the order of the topics in the

assignment instructions, they did so in a way that was unclear to the reader.

Here, the instructor might provide a model for writing such an assignment (after providing feedback on the omission) by saying that:

> *One good way to ensure that you address all of the parts of an assignment is to simply use the assignment directions as headings in your work. This assignment had five parts, so you could first write down "Plato's Theory of Virtue, Aristotle's Theory of Virtue, Similarities in the Two Views, Differences in the Two Views, The Superiority of Aristotle's View over Plato's View." Then you could fill in your text between the headings. This would guarantee that you completed all parts of the assignment in a format that the reader can understand.*

There is also nothing wrong with providing a straightforward example of what was missing. Imagine that a student submitted a paper without any introduction. An instructor might say:

> *There is no introduction to this work. It is important to always include an introduction to provide the reader with context as they read the paper. One good way to start a work is to state why the topic is important. This "motivates" the work and gets your reader interested in what you are saying. For instance, here you could have started with:*
>
> *"It is natural to assume that children gain skills as they develop so that older children will do better at any given task than younger children. However, a recent study by Sommers found that younger children actually outperform older children at certain types of intellectual tasks. We will explore this finding by first looking at the study that yielded the results, the types of tasks for which younger children outperform older children, and possible explanations for the phenomenon."*
>
> *Notice how this introduction first captures your reader's attention by stating the surprising finding and why it is counterintuitive, and then gives a very brief overview of what you will cover.*

Some instructors deliberately avoid providing a model of good work on the grounds that it constitutes "doing the assignment for the student," or "holding the student's hand," but this is simply not true. Nobody would say of a coach who takes the bat from a player and says "This is what you are doing. You're dipping your back arm like this. Instead you need to lift it up like this" that they are somehow playing the game for the player or holding the player's hand. Rather, they are being a good coach by showing the player exactly what her problem is and what can be done to correct it. Faculty need to think more like coaches, which means being very clear and detailed in their feedback and directives. Only this level of detail will cultivate improvement on the part of students.

Feed up

Recall that feed up is information on the purpose of an activity. Feed up comes in two forms. The first is information on the purpose of an assignment. An instructor might say:

> *This assignment teaches you how to create a clinical ethics recommendation. As a doctor or nurse, you will encounter numerous ethical issues involving end-of-life situations, and you will be part of a care team that will make genuine life-or-death decisions. This exercise will prepare you for participating in those conversations and advancing reasoned, well-defended, and persuasive positions that will guide the final decision.*

The second type of feed up relates to the value of some prior feedback or feed forward. An instructor might first provide feedback on the student's lack of citations for their claims, and then follow that with:

> *Citing your sources is not just an academic exercise. It is not just for fulfilling the assignment requirements or proving that you have not plagiarized. Citations support your positions, and thus ultimately strengthen them. You want to persuade your reader of something, both now and in the future, and a citation will help get them to accept your authority and thus bring them to your way of thinking.*

We do not listen to feedback that we don't believe has any relevance to us.

Feed up answers the question "What is in it for me?" Teachers generally don't think that they have to give a reason why an assignment is important. After all, the student signed up for the course, and so signed up for the assignments. The grade itself should be enough of a stick for paying attention to feedback, so why is a carrot needed?

Any parent who has told their teenage child to change how they dress for school because they appear sloppy knows that the advice is going in one ear and out the other. The child figures that the parent is appealing to social norms that are 30 years out of date, norms that simply do not apply to today's high school. We do not listen to feedback that we don't believe has any relevance to us, even when it comes from an authority.

The second reason for feed up is that it helps reinforce the notion that the purpose of an activity is learning, rather than a grade. As noted in the introduction, a student's fixation on grades diminishes their learning. Instructors can counter this tendency by always couching their feedback within the context of learning outcomes. Since these learning outcomes outlive the course, students have a far greater incentive to pay attention to them than advice that will just lead to a better grade. Moreover, feed up can transform a student's attitude toward the course

itself. Naturally, students can interpret classwork as drudgery. But when a higher purpose is attached, the student will start investing more time, effort, and interest in the activity as a way of leading to an outcome that the student values.

A good model is to incorporate feed up about the benefit of an activity into the activity directions themselves. Ideally, the student should see the "why?" of what they are doing before they do it, rather than afterward. Instructors can simply preface each activity with a short statement of its higher purpose. The instructor can also cut and paste that feed up to the beginning of their commentary on the student's performance as a reminder of why the assignment and feedback on it are valuable. This will help the student retain the feedback and feed forward that is provided with it.

4 The Problem with Praise

Most teachers use praise as a form of motivation. Don't we praise our kids with a "good job!" when they do well? To be anti-praise almost sounds like being anti-nice.

But research has shown that praise actually provides little, if any, benefit for the student, and in many cases can even be harmful. For instance, studies have shown that adult learners may interpret praise as a sign that the teacher has a low regard for the student's abilities. The student hears "excellent job" as a sign that the teacher was surprised that the student could actually do well on an assignment. Worse yet, it can set up an expectation of praise on all the work. The result is demotivation when that praise is not forthcoming (Wulf-Uwe, 1982).

Praise can also have harmful effects on younger students. The evidence is that intellectual capacities grow over time, but praise for ability tends to lead students to believe that their intellectual capacities are fixed by nature (Dweck, 2007). As a result, the student assumes that their performance is not something under their control, which dampens motivation to improve. These students do not put in the same amount of effort when faced with a difficult task, because they assume that it is simply beyond their natural abilities. They also don't learn from their mistakes, which hampers their intellectual growth.

Another harmful effect is that praise creates the impression that the goal of the activity is to please the teacher. It's important to remember that praise is essentially a statement of approval of another person's actions or qualities. Thus, it is connected to the person giving the praise. Faculty reinforce this notion when they provide feedback such as "I really enjoyed reading your paper." Here, the feedback is given in terms of gaining the teacher's personal approval.

But the goal of an assignment should not be to please the teacher, but rather to meet a standard of performance. Basic feedback should always be in the form of "The goal was to do X, and you made it Y distance toward that goal." Students whose goal is to please the teacher have adopted an extrinsic motivation, rather than the intrinsic motivation of learning and personal growth. As mentioned earlier, extrinsic motivation has been proven to diminish performance on complex tasks.

Praise can even lead the student to wrap up their own ego in their performance and pleasing the teacher. This can lead to students hiding their mistakes, or worse yet, even falsifying them. A study found that among students who were asked to report their scores to others anonymously, 40 percent of those who had been given prior intelligence-related praise falsified them, while only 10 percent of those who did not receive such praise chose to make false claims.

Finally, praise can water down the important feedback needed for improvement. Consider the following example:

I enjoyed reading your work. However, I would make one suggestion: Make sure to thoroughly read the directions before starting a work. There were a lot of issues that you missed. You also incorrectly characterized the claims made by Locke, and as a result drew a number of conclusions that do not apply to his theory. Keep up the good work!

This is what is commonly known as the "feedback sandwich." Instructors feel that they should always start with something positive and end with something positive to keep up a student's spirits. But the problem is that students may simply read that praise to the exclusion of the real feedback in between. Here, the first sentence, "I enjoyed reading your work" and the last sentence, "Keep up the good work" are at variance with the problems in between. If the student did not follow the directions and mischaracterized the author, could it really have been "good work?" With incongruity between the middle and the end points, the student might just hear the first and last sentence and avoid the middle. Alternatively, the student might come to realize that the instructor always applies the feedback sandwich to assignments and come to dismiss it. The student thinks to herself, "I could hand in garbage and he would still tell me how great it is."

If a student has a number of serious problems, it is better not to obscure them with niceties. In this case, the instructor should have started with "There were a number of issues in your work. First…" This would ensure that the student's mind is focused on the important points so that they get through. The feedback on problems is what will lead to the student's improvement, not the praise.

But the news for praise is not all bad. It's been shown that praise can be effective in some situations when it is directed toward the student's *effort* rather than *abilities* or *performance* (Dweck, 2007). The difference is that we can control our level of effort. Students praised for effort came to believe that their intellectual abilities were not fixed, but rather malleable, and that they could do something to improve them. These students adopted a growth mindset. For instance, when students were given the option of either a challenging task or one that was less challenging but more likely to be completed error-free, those praised for effort chose the more challenging task as an opportunity to learn, while those praised for intelligence chose the less challenging task to avoid failure.

The effects of praise on performance are thus a mixed bag and depend on a number of variables. Instructors should apply these findings as they see fit. Nevertheless, given the variety of evidence related to the harmful effects of praise, the teacher should probably err on the side of caution by being judicious at best in their use of praise.

Positive and negative feedback

While praise has been shown to be harmful in many circumstances, the same is not true for positive feedback, and so we must distinguish the two. Positive feedback can be thought of as information on what a student did right in their quest to reach a goal. Conversely, negative feedback is simply feedback on what a student did wrong on their way to a goal (Bookhart, 2007, p. 25–26). Note how positive and negative feedback are given in reference to a goal or standard of performance, rather than in reference to a person's attitude. Positive and negative feedback are thus more objective

than praise, and the evidence points to them being effective ways to improve performance.

An example of positive feedback is:

> *Mary, you correctly described Nietzsche's theory of justice. Importantly, you did not just provide a serious of quotes from the author, as you tended to do at the beginning of the course. Author quotes do not demonstrate an understanding of the underlying concepts. Stating the author's position in your own words demonstrates understanding, and you are doing that more often now. You are also starting to use examples to illustrate your points. This is an especially important practice because it demonstrates that you can apply the concepts to practical situations. Keep providing examples, and your work will continue to improve.*

Note how the feedback first described how well the student accomplished one of the assignment tasks. This is not praise, or approval, but rather a statement of what the instructor observed. The feedback is given in relation to the assignment and the standards by which to complete the assignment, rather than the instructor's own feelings.

The feedback also referenced where the student stands in relation to her growth across the class. Feedback too often is focused solely on the student's performance on a specific assignment. But the assignment is just part of a learning trajectory, and that trajectory is the ultimate focus of the course. Drawing attention to a student's growth helps encourage "metacognitive monitoring" by the student of their own intellectual journey (National Research Council, p. 18). This has been described as an "internal dialogue" that someone has with themselves about their intellectual development.

The internal dialogue is critical to intellectual growth. Experts tend to have a sense of where they are in their development—what they know, and what they do not know—and thus have a sense of what they need to work on next. A football player may say to himself "My pass blocking is solid; I just need to improve my run blocking." Without such a dialogue, the person is floundering, not knowing what they should focus on to improve. But experts tend to approach new information self-reflectively, asking how it relates to their current understanding, and ultimately how it can be incorporated into an overall picture that advances their level of expertise. Faculty can aid in this growth by always reminding students of where they are on their growth path.

Hattie states that "feedback is more effective when it provides information on correct rather than incorrect responses (2007, p. 85), but new research suggests that the reality is somewhat more nuanced than that. A recent study found that experts are more eager to hear negative feedback, whereas novices are more eager to hear positive feedback (Finkelstein and Fishbach, 2012). The reason is that experts are more secure in their abilities, and thus are more focused on what they need to do to fill their gaps, whereas novices lack confidence and want encouragement.

Of course, what a student wants to hear and what a student needs to hear are different things, and so the results should be taken with that in mind. But this shows how feedback is interpreted

differently at different stages of intellectual development, and with different groups. This is important to keep in mind. Positive feedback is important because students need to know what they did right in order to replicate that in future work. Faculty need to remember that the goal of feedback is to nurture the desired performance and address deficiencies. This means focusing on both what was done well and what was done poorly in order to keep moving the proportion between the two in the right direction.

5 The role of questions in feedback

Questions have always played a central role in teaching. Questions force reflection by the student, which is the first step to insight. Socrates famously based all of his teaching on questions, which is why many faculty use questions in their feedback.

But Socrates used questions as part of a real-time dialogue, which is not the case when questions are used as feedback on assignments. Questions in feedback do not provide students with the ability to reflect on the question, answer it, and get feedback on the answer. The teacher who drops a question into an assignment has no way of knowing whether the student even tried to answer it, and if they did, whether the answer is taking them in an entirely wrong direction. Thus, it is important to follow some fundamental principles when applying questions in feedback that is not part of a live dialogue.

Questioners and comments

Faculty very often insert a question into their margin comments as a means of pointing out a missing or underdeveloped part in a student's work. For instance, an instructor might leave the margin comment "What does this say about Dell's leadership style?" to indicate that the student should have covered that topic in the assignment.

But the student does not necessarily know from the question that the instructor is pointing out a missing element in their work. The student might wonder whether the question is simply being posed as food for further thought. Perhaps the student's work was so interesting that it got the teacher thinking about this issue, and the teacher is inviting the student to participate in their thinking. We generally ask questions that we would like answered. Thus, the student might wonder if the instructor wants the student to send him an email in response to the question.

The problem is that the question is not a real question per se; the instructor does not expect the student to answer it now. The instructor wanted the student to answer it earlier in the work. In that sense, the question is more a statement than an actual question. The instructor is not asking anything, but rather telling the student what topics should have been included in the work.

The instructor is really using the question to first point out a deficiency, and then providing advice on the process of developing an assignment. The question is really a comment, not a question. A big part of reading, writing, and thinking is simply knowing what questions to ask, and the instructor is prodding the student to ask the right questions. The instructor is teaching the student the process of developing an assignment by pointing out the questions that should be driving that process.

It is clearly important to teach students the development process. But using a question as a comment is not an effective way to do that. In general, the student should not be left to infer a deficiency from a question, because they may not make that inference.

Just as with all feed forward, the instructor needs to preface the question with a statement of the problem. The instructor might start by pointing out the problem with "The assignment asked you to analyze Dell's management style, which you did not do." Once the problem has been stated, the instructor can now provide the context to the question by stating how it is being used. The instructor might say that "You should have asked yourself what this episode says about Dell's leadership style. Why did he respond as he did, and did this show him to be a great leader? These questions will lead you to fulfill the part of the assignment concerning Dell's management style." Now the student is prompted with a clear statement of a deficiency and understands how the question is being used to provide guidance on how to fix it.

Scaffolding responses

An instructor often asks a question with a specific answer in mind. The instructor might ask "What does this episode say about Dell's leadership style?" but have a fairly clear idea about what it says about Dell's leadership style; they want the student to reach that answer through reflection.

But we know that in a live dialogue, students often reply to these questions with something like "I'm not sure what you mean," or an answer that is far off the mark, and it is no different in an asynchronous environment. In a live dialogue, the instructor has an opportunity to clarify the question, or follow up with further questions or comments that redirect the student's thinking. We do not have that in an asynchronous environment, and so a wrong impression does not get corrected.

As a result, instructors need to be more directive with their questions in an asynchronous environment. For instance, a teacher might start by asking "How could the CEO have handled the situation differently?" and then follow up the initial question with some directing prompts, such as "Would there be a way to engage the customer here, or perhaps the supplier?" These prompts provide some initial scaffolding to the reflection, pointing the student in the right direction. Now, when the student starts thinking about how to fill in the missing elements, the student is likely to come to the right conclusions.

Follow-up

The best way to ensure that a student is indeed reflecting on a question provided in feedback is to simply have them answer it in some form. An instructor might ask "What do you think the therapist could have done differently in this case? Send me your thoughts by email." Not only will this ensure that the student actually considered the question, but the instructor can then determine whether the student is going in the right direction with their answer and can reply in a way that fosters the student's continued reflection and intellectual development.

Another option is to ask questions that can be answered in later assignments, and then have students point out where they answered those questions in their work. There is nothing wrong with asking students to add commentary about the work itself as an assignment. This is sometimes called "making thinking visible," and is a powerful way to gain a perspective on a student's thinking process itself.

This commentary can be added through margin comments to point out directly where the student incorporated prior feedback into their work. Faculty often think that the MS Word commenting feature is only for faculty members to send comments to students, but there is no reason why students cannot also use it to send comments to faculty about the process of developing their work. A student can highlight a passage and add a comment such as, "Here, I talk about the question you asked on assignment 3." The faculty member can then reply to the student's comment with a comment of their own below it, thus creating a dialogue about the student's thinking and the work development process.

6 Putting It All Together—A Feedback Model

Reading the work

• Getting past the copy-editing mindset

This last section provides a model for giving high-quality feedback to students, and it's best to understand it in contrast to the approach commonly used by faculty. Most teachers grab a stack of student assignments, sit down with a coffee (or some stronger drink), put their chin on their palm, and begin the drudgery of grading assignments. Teachers read each student's work from start to finish, circling errors along the way, making a few margin comments, and mentally subtracting points for content errors. At the end, they give a grade with a couple of lines of summary feedback.

Teachers who read a student's work in this way commonly fall into the "copy-editing" mindset of looking for writing problems, and especially surface writing programs such as misspelling or grammar errors. Writing problems then become the focal point of their feedback. This is partially because writing mistakes tend to jump out at us. We get a letter that says "Dear John, I have loved you for 10 years, but I met somone else and am leaving you," and our first thought is "She misspelled "someone. '" Plus, writing errors—especially surface writing errors, such as grammar—are easy to spot because writing is fairly rule-guided. So the mind tends to fall into using rule-guided thinking, because it is easier than the more complex thinking needed to follow concepts.

The problem with the copy-editing approach is that it comes at the expense of reading for the "thinking issues" that should be the real focus of a faculty member's efforts. Faculty are not hired for their copy-editing skills. That is a skill that is widely available elsewhere. Faculty are hired for their knowledge of their field, and so the thinking issues should be the primary focus of their work with students, not surface writing issues.

Many teachers feel compelled to focus on writing issues when they are severe in the belief that students should leave school with good writing skills. While this is true, the fact that the student has a severe writing problem does not necessarily make it the teacher's job to rectify it. After all, if a student's performance is hampered by alcoholism, the teacher does not make it his or her job to solve it. The teacher sends the student to a counselor. Similarly, if an instructor is hired to teach psychology, they should focus on teaching psychology and send the students to writing help to work on their writing skills.

Moreover, how likely is it that a teacher will fix a student's severe writing problems in one assignment, or even one class? It's not likely to happen, so why waste effort trying? If the student has a few writing issues here and there, they can be addressed without taking attention away from the important thinking issues. But spending a lot of time on writing issues only comes at the expense of thinking issues, which usually means that the student will get help with neither. It is better to just focus on the thinking issues.

• Key-word reading

Another common error is to fall into the trap of looking for key words as a sign of concept-knowledge. If the essay topic is research methods, the instructor might check off the student as having gotten the concept just because the student used the terms "independent" and "dependent variables." But the student might have simply copied what they found in the text without actually understanding the concepts.

For instance, a student might say that:

> *A researcher needs to separate independent from dependent variables in order to determine which variables are to be controlled, and which are to be manipulated.*

This is fine as long as the student follows it up with a description of an independent and a dependent variable in their own words, as well as what it means to control or manipulate variables, to demonstrate understanding. Faculty who read for key words are doing a superficial reading of the student's work and thus can be easily fooled into thinking that a student understands. Students can often pick up on faculty who are looking for key words, and skate through by using copious key words throughout their work.

Like copy-editing, reading for key words is a convenient shortcut that the mind can use to avoid the more difficult task of trying to follow the student's thinking in order to assess real understanding. A good practice is to remind students at the beginning of class that the purpose of an assignment is to demonstrate understanding of the material and that direct quotes and key words do not demonstrate understanding. Thus, the student should write with the assumption that the reader has a college-level understanding of English, but not a technical understanding of the field. This will require students to unpack technical concepts in plain English, which will allow the teacher to properly determine the student's level of understanding.

• Deep reading

Good feedback begins with a good reading of a student's work, which means reading deeper than surface writing issues or key words in order to understand the student's real level of understanding. Faculty need to remember that there is a person who wrote the work, a person who may or may not understand the material, and that feedback is directed to the person, not the assignment. Faculty teach students, not subjects, and thus must read an assignment with an eye toward gaining an understanding of the strengths and weaknesses of the student in order to address them.

Faculty should think of reading a student's assignment as doing detective work; they are trying to create a picture of the student. This is done with a "deep reading" that looks past the words of the assignment in order to determine the student's understanding. The best way to do a deep reading is to put down the "red pen" and to simply read the work from start to finish without making comments to the student. This is often hard for faculty who are used to the copy-editing approach. They see a grammar error and they want to point it out. But it is better that they write nothing at all and just focus on gathering an overall impression of the student's level of understanding.

If an instructor wants, they can write notes to themselves as they go along in order to keep track of their internal dialogue about the student. These notes could be temporary margin comments that will later be removed or translated into a comment to the student. For instance, the comments on a student's work might be:

> *No introduction. He did this the last time as well.*
>
> *Just a direct quote. Nothing in her own words. Does she get it?*
>
> *He keeps confusing independent and dependent variable.*
>
> *She doesn't understand how Plato's metaphysics influenced his political theory.*

In either case, the instructor is reading for an understanding of the student, not surface writing problems. Note how the comments concern the student themselves, not just the work. The student's work is being used as evidence to draw inferences about the student. These inferences relate to questions such as:

- Does the student understand the assignment?
- Does the student understand the concepts?
- Can the student express their understanding well?
- Why doesn't the student understand the concepts?

The instructor might be taken aback at this last question. Few instructors make the effort to determine why the student is having trouble. Instructors who fall into the grading mentality think that their job is to just point out the student's problems and issue a grade. But this is not teaching. A coach does not just give a player a grade after a game, along with a list of mistakes, and move on. A coach diagnoses the reason for the player's problems with an internal commentary something like this:

> *Bill keeps getting driven off of the line in short yardage situations. His problem is standing too high. I've shown him how to stand a number of times, so why does he keep doing it? Maybe he's trying to peek over the line to see the pre-snap formation? Maybe he's trying to get out of his stance more quickly? I'll need to talk with him about why he is doing it and explain to him that staying lower will improve his play.*

Notice how the coach is starting with an observation about the player's performance, and then using that to diagnose the reasons for the problems. Players, and students, make mistakes for a reason. As mentioned above, it could be a problem with the process of creating the work. If the instructor sees that the errors consistently relate to the readings, rather than lecture material, then the student is displaying evidence of a problem with reading academic work.

Sometimes there might be multiple possible explanations for a student's problem. Imagine that a student consistently uses direct quotes instead of putting concepts into her own words. An

instructor might naturally assume that she does not understand the concepts, or that she is lazy and just grabbing key words to avoid the work of understanding and explaining concepts. But it might be that she thinks that direct quotes are what the instructor wants. It might also be that the student is overly frightened of a plagiarism accusation.

In either case, the student might need a tutorial on the use of quotes. The student might need to know that direct quotes are best used when the object is to comment on the author's claims themselves, and the quote demonstrates that the student is not mischaracterizing that author's position. However, when explaining a concept, the instructor might want to see it put into the student's own words in order to demonstrate understanding. This distinction might be all that the student needs to see to change her performance.

Writing the feedback

• The priority of introductory comments

Most instructors center their feedback on margin comments. They read a student's work, making margin comments along the way as issues arise, and then jot down a few sentences at the end to summarize those points. In this model, summary comments are an afterthought, and are put in the service of margin comments.

But it is more effective to turn the approach on its head by making introductory comments the primary vehicle for feedback. The instructor should read the work through first without making comments to the student in order to develop an overall picture of the student and their fundamental needs. The instructor then addresses these needs with a few paragraphs of introductory comments that focus on one or two main issues that the student needs to address. Margin comments are then added afterwards to point out places in the work where the introductory comments apply. In this way, margin comments are put in the service of introductory comments.

Why prioritize introductory comments over summary comments? The main reason is that teaching is fundamentally about cultivating expertise in a student, and expertise is essentially narrow and deep, rather than broad and shallow. Many people think that expertise is having a broader range of information about a subject than nonexperts. But it turns out that expertise is not a function of a broader knowledge base, but rather a deeper understanding of the "big ideas" and "core concepts" that underlie the field. Experts can perceive the deep patterns that are not visible to novices (National Research Council, p. 36).

For instance, in one study, both expert and novice chess players were given five seconds to view a chess board, and then were asked to reproduce the configuration of pieces that they saw. Not surprisingly, the experts did much better than the novices. But then the experiment was repeated with the pieces placed randomly across the board, at which point the expert's advantage vanished.

What happened was that novices saw the board as just a bunch of pieces without meaning, and could only try to memorize the individual pieces as best they could, like trying to remember a random string of digits. But experts saw the arrangement as patterned. They don't see pieces as

much as they see strategies represented by patterns. Ben Kingsley put it well in the movie *Waiting for Bobby Fisher* when he said that Bobby Fisher "got underneath the game of chess."

Just as a master's job is to instill knowledge of their field in the apprentice ("See, when the metal glows this bright, it's too hot and will break if you try to bend it. You need to let it cool down before working on it."), the instructor is instilling in their student the core concepts of the field. These core concepts are illuminated by feedback that is focused and deep. Thus, introductory comments should be organized around one or two themes, which allows for the deep dive into underlying concepts, and margin comments are primarily used to point out places in the work where the main themes in the introductory comments apply.

By contrast, instructors who start by dropping in margin comments as they read a student's work are merely addressing issues as they arise. These comments lack any meaningful structure; they are organized chronologically according to the order that they appear in the work—and tend to focus on the superficial, such as grammar errors. String all of these margin comments together, and you would not get a coherent paragraph but rather a jumble of different points.

Expecting students to do their main learning from these margin comments presents a disorganized, and shallow, type of feedback—one that misses the core concepts that should form the heart of teaching. Introductory comments by their nature lend themselves to narrow and deep feedback, while margin comments by their nature lend themselves to broad and shallow feedback.

The same is true when summary comments come after margin comments and merely draw the margin comments together. Consider the following example:

> *Although you incorporated some good information, you missed a number of issues, such as the role of the market in Dell's decisions. You also did not cite all of your sources. You provided brief descriptions of both business professionals, but did not provide enough analysis. You also did not address the resistance that each CEO received to his ideas. Make sure to watch your subject-noun agreement in future work, and focus on laying out your work in a more linear fashion, rather than jumping back and forth between topics.*

The faculty member here is simply summarizing the different issues that appeared, and as a result is presenting a scattergun approach to feedback. By contrast, consider the following example of a medical ethics instructor who sees a student confusing the concepts of "paternalism" and "patient autonomy":

> *One very important concept that you need to get out of this assignment, as well as the class as a whole, is the fundamental tension within the medical profession between the long-standing attitude of paternalism toward the patient and the more recent move toward respecting patient autonomy. This distinction underlies most medical ethics questions, and you will see this played out repeatedly in your own practice as a doctor.*

The problem is that you interchanged the terms "paternalistic" and "patient autonomy" at a number of places. See where I have highlighted some examples in your work in red.

"Paternal" literally means "fatherly," and in the medical context means that the doctor does what he or she thinks is in the best interests of the patient. The patient here does not have a say in their own treatment. "Patient autonomy" means respecting the patient's wishes concerning their treatment. For instance, if a patient with breast cancer has two possible treatment options—radiation therapy or a mastectomy—the doctor who chooses the mastectomy for the patient because it has the greatest chance of success is acting paternalistically. By contrast, the doctor who allows the patient to choose radiation therapy, despite the doctor's own view that a mastectomy has a better chance of success, is respecting the patient's autonomy.

Here, the summary comment is organized around one main concept that underlies much of the medical ethics field. The student is being taught the ability to perceive this concept in clinical cases. This perception will help provide a context to deliberating over the cases.

Importantly, the student is first shown the concept in the introductory comments that he or she reads before going through the margin comments in the work. The student's mind is focused on that theme, and their reading of the margin comments amplifies and illustrates that theme. The margin comments are structured by the introductory comments, and support them, thus reinforcing the underlying concept that the student needs to learn to become a medical practitioner.

Note also the reference to color-coded comments. As mentioned, margin comments should support a small number of introductory comments. A good way to connect the two is via color coding. The introductory comment above could be highlighted with a red background, and the same background could be used for the margin comments. Now the two are clearly tied together so that the student can go from the introductory discussion to the examples without searching around. The same can be done for any other introductory comments, each using a different color. Now, instead of reading all the comments and trying to keep them in mind as the student reads through the various margin comments, the student can go back and forth between the two on specific points to reinforce the feedback.

Another reason to limit the number of themes covered by an introductory comment is that the mind can only focus on so many things at once. The first season of HBO's "Hard Knocks," which followed the training camp of an NFL team, showed the running back coach of the New York Jets speaking to a rookie back before practice. He asked the back, "What one thing are we going to work on today?" to which the back replied, "Ball control." So that day the back was going to work on protecting the ball. This did not mean that ball control was the only thing that the rookie needed to learn—he probably had to learn a hundred things—but those things needed to be learned by the end of training camp, not that day, and the best way to reach the goal was to focus on one thing a day.

Similarly, faculty forget that the goal is to produce understanding by the end of the course, which could be 12 to 15 weeks long, not in one assignment. Faculty should not feel compelled to list all a student's problems on every assignment. This will only confuse a student, and make it difficult to focus on something tangible to improve. Remember that feedback is given for improvement, not to justify the grade, and so any feedback that does not lead to improvement is useless. With that in mind, faculty can, like the coach above, ask themselves, "What one thing will I focus on today and ask the student to work on for the next assignment?" Faculty can then provide the feedback, and see if it has made a difference in the student's performance on the next assignment. Teaching is an iterative process, with improvements coming in steps. Limiting feedback to a small number of big issues allows the teacher to draw the student along the path of improvement.

• How much feedback?

One common question faculty ask is "How much feedback is enough?" This also leads into the follow-up, "Can there ever be too much feedback?" When asked, the student panelists in the abovementioned feedback webinar replied with a simple "The more feedback the better." Hattie has said that faculty should give "dollops" of feedback, and the late writer David Foster-Wallace was loved by his students because he would read their papers three times and add more and more feedback on each round (Max, 2012).

But these claims must be tempered. The students in the feedback webinar were reacting to a situation of getting almost no feedback at all from their instructors, and so their replies are akin to what you might get from a starving man who has been asked "How much food is enough food for you?" The students went on to say that they are not expecting pages of grammar feedback, which can be overwhelming, but rather as much feedback as possible on the "big ideas." Hattie himself has since said that he regrets his "dollops" statement, and clarifies that more is better only concerning the right type of feedback.

Wiggins (2012) often hears the objection from teachers that they do not have time to give much more feedback than they already provide. But he responds that teachers should be trading feedback for instruction. Remember his quote that "We spend too much time teaching, and give too little feedback." Remember also how Eric Mazur spends time in his physics lectures giving feedback to and getting feedback from students.

Faculty often go into their classes with a "covering material" mentality. They think that all of class time must be spent pushing information to students, and so the goal is to cover a quantity of material by the end of the class. But if students are only retaining a small portion of the material in a traditional lecture, as every study indicates they are, then most of that time is simply wasted. It does not help to cover material that students do not retain. Faculty are better off covering fewer topics that students will retain, and this can be done by swapping teaching for feedback to make it a zero-sum game.

• Implications for curriculum and assessment

Curriculum, assessment, and feedback form the three legs of teaching, and so we will conclude our

discussion of feedback with a brief exploration of the implications for assessment and curriculum. Recall that expertise is narrow and deep, rather than broad and shallow. This expertise is usually formed by abstracting core principles from repeated practice in different circumstances (National Research Council, p. 20). A master chess player may take 50,000 games to learn his craft, but what he is learning is the underlying patterns that repeat themselves in different formations. He sees certain formations as fundamentally defensive or offensive, and how certain formations can be attacked. Moreover, having repeatedly seen a piece taken by a bishop from across the board, he comes to recognize that people tend to think in vertical and horizontal lines, and so don't see attacks coming at them diagonally.

This suggests that a curriculum should cover a variety of different examples in different circumstances, and that each should be discussed within the context of core concepts that the instructor wishes the student to understand. The mind is not a database that can store millions of bits of information. It is, rather, a meaning-making device that organizes new information according to underlying principles. Experts chunk information into meaningful pieces to identify the underlying principles that will solve a problem. Feedback should be directed toward illuminating how these underlying principles apply in different situations.

Moreover, feedback is most helpful when students are allowed to apply it. Video games are a powerful learning device because feedback is both given and applied quickly. The player who gets killed going through a certain door is able to try a different path right afterward. Thus, it is far better to use assessments that allow for timely feedback, rather than feedback far off in the future. Interestingly, many courses still finish with a big "final exam" that provides the student with little, if any, feedback.

Moreover, assignments should be designed to allow students to apply feedback from the previous assignment to the next one. One common error instructors make is to cover 14 different topics in their 14-week courses, using one assignment per week to assess each topic. The feedback that students receive on one assignment may not have any application to the next assignment. It is far better to give students seven assignments, each done within a week and then redone after having received feedback from the instructor. College faculty know that their own professional work is revised multiple times in light of feedback from different sources before it is worked up to publishable level. Yet they often do not provide students with the same opportunity.

Curriculum, assessment, and feedback need to be aligned into a coherent, and mutually supporting, whole in order for real learning to occur. Perhaps the best formula for tying all three elements together is simply "narrow and deep, not wide and shallow." Feedback that is disjointed and focused on superficial issues provides the student with little benefit. Limiting feedback to a small number of important points, and going into them in great depth, will produce incremental growth toward achieving mastery. Faculty who adopt this model are surprised at the positive results.

Transforming the feedback experience

Teachers who adopt the feedback principles discussed in this work are often surprised to find that their fundamental approach to feedback has been misguided their entire careers. This can be a bit shocking. But it may explain why students fail to improve during a course. Improper feedback is often the problem. Faculty who learn how to give quality feedback see a radical transformation in their students' learning outcomes. They start seeing students making progress that they were not seeing before.

Best of all, learning how to give good feedback also tends to transform an instructor's experience of grading. Most faculty consider grading a drudgery. But the process of giving proper feedback involves a fundamental change in mindset toward grading. Now, instead of being a mechanical process checking off boxes to subtract points, grading becomes an opportunity to connect with students. The student's work goes from becoming a mind-numbing series of errors to becoming a puzzle to be solved. This makes grading more akin to reading a scholarly article, an experience that draws upon higher-level cognitive skills that engage us, rather than bore us.

Good feedback not only transforms learning, but reinvigorates teaching itself. The instructor will start truly connecting with students on an intellectual level, which is a joy in itself, and what teaching is all about.

Appendix A: Voice Feedback

The benefits of voice feedback

For the past hundred years, folks in higher education have assumed that feedback must be written. Even when the assignment itself was not in text form, such as a video, instructors usually provide written comments. But feedback can be given in a myriad of different ways, including audio, video, screencasts, and more. Researchers are just now comparing different methods of providing feedback, with some pretty surprising results.

Educational researcher Phil Ice compared the efficacy of voice feedback to text feedback through a number of studies. Ice started with a graduate teaching course of 34 students and continued with a variety of courses totaling over 300 students. Ice had faculty give students text feedback on some assignments and voice feedback on others. Faculty were not given any directions about the content of the feedback. They were simply told to give whatever feedback that they thought was appropriate.

The results were striking. As one student put it:

> *"We've had written comments twice and verbal comments twice now. Let me guess—this is someone's research project, right? Let me just save you some time. The verbal feedback is much, much, much better than the written."*

The end-of-class survey in the graduate course demonstrated a strong preference for voice feedback. Of the 31 respondents:

- 26 students preferred audio over text
- 4 had no preference
- 1 did not participate due to technical problems

Interestingly, nobody expressed a preference for text over voice feedback. The follow-up survey in other courses showed a similar distribution. 312 respondents were asked to answer the question "I prefer audio feedback to text-based feedback," on the classic five answer scale from "strongly disagree" to "strongly agree." The mean answer was 4.47, which was centered between "agree" and "strongly agree." Only 9 students out of 312 disagreed or strongly disagreed.

Five general themes emerged from the studies:

Theme one: increased content retention

Content retention is where the rubber meets the road. Students believed that they retained audio feedback better than text feedback, and interestingly, students also believed that they retained content to which the audio feedback was related better than content for which they received text feedback. These beliefs were supported by the observation that students incorporated audio

feedback three times more often in their final assignments than text feedback. In other words, students were not just getting it better with voice feedback, but also taking it more to heart. One student explained the results thus:

> *"I like this [audio feedback] because I am listening to what you are saying and scanning what I wrote. I can see what you are talking about and it clicks that way. Now, granted, I might have to listen to it and read it two or three times because doing both at once makes it all not stick as well, but in the end it works better than if both parts had been written only."*

Theme two: increased instructor caring

Studies showed that because voice feedback was more personal than text, it conveyed a sense of instructor caring. One student had a great comment. To understand it, you have to know that Phil Ice has a strong southern drawl. The student said:

> *"After reading the syllabus, I was nervous about whether I could live up to the expectations of the course; it sounded so strict. But after hearing your voice, I felt better when I realized that you're just a hick like me."*

Theme three: more feedback in less time

Simply put, we can speak faster than we can type. Plus, we feel compelled to reread our text comments to remove the grammatical errors and to polish up the prose. This can lead to comments that sound overly austere.

Without any direction at all, faculty were found to be giving more voice feedback in less time. The numbers were:

- Mean time spent on student feedback
  - Text: 13.43 minutes
  - Audio: 3.81 minutes
- Mean quantity of feedback provided
  - Text: 129.75 words
  - Audio: 331.39 words

Faculty were also found to be using five times as many adjectives with voice feedback than with text feedback. Use of adjectives is associated with more expressive language, which keys into our emotional centers—the centers that really pay attention.

Theme four: improved ability to understand nuance

The most common theme expressed in semi-structured interviews was that students could understand nuances in a faculty member's feedback much better when it was given by voice. One student's comment summarized it well:

> *"I have taken a couple of online classes and every time I would get these notes or critiques or comments back from the instructor and I would be wondering exactly what they were trying*

to say. I mean, I would understand what they were saying, but not the way they were trying to say it. Sometimes, you would wonder if they were agreeing with you or trying to figure out how to politely say you had it all wrong.

Now, when I first heard the audio feedback I was like, "Wow! I get what he is saying to me." It was all in your voice and I understood when you were saying something like, "Well, this is good, but..." I understood then that you really liked what I was doing, but were trying to tell me to add a little more, but in a good way.

Theme five: less isolation and more motivation

Online education can be an isolating experience. Without the community of fellow learners in a classroom, an online student can feel like he or she is on an island. Traditional text feedback can add to this experience by giving the impression that it is coming from a robot—the ideal of a "teacher" rather than a human being. The presence of voice reminded students that the teacher is a human being, and as a result made them feel less isolated, and they were more motivated to participate in the class.

Follow-up research has supported these findings, and added some as well. For instance, it was found that voice feedback served to motivate students to engage in independent learning (Bhagat, 2012). One study found that students were more likely to book further tutorials with instructors when feedback came in voice form, and another found that voice feedback helped students develop new ideas and perspectives as a result of analyzing their work. Some studies even suggest that voice feedback is helpful for students with English as a second language, or with learning issues such as dyslexia.

When is voice feedback most effective, and when is it not effective? The studies suggested that voice feedback is best used to make conceptual points—the kind that require elaboration. Here is where the nuance conveyed by the voice can better express the contours of what the faculty is saying. It is easy to misread the tone of a text comment, especially when it concerns a criticism of one's work. Hence, the need to be careful in how we express things in emails lest they be interpreted overly sharply. Voice modulates the tone of our words to demonstrate that we are not angry or disappointed but merely providing information in order to help.

This is why voice feedback is best used for summary comments, rather than short margin comments. Tone is not terribly important when pointing out a misspelling or wrong tense. Plus, the time savings is lost with short text comments, because the process of setting up the recording and attaching the sound file negates the time saved in speaking.

The instructor can read through the student's work first, without making any comments, and then record their voice comments on the general themes that need to be addressed. This recording can be embedded into the version of the student's work that gets returned to them. The student will just click the icon showing the comment and it will play. The faculty member can then add any margin comments as they normally would.

Here is more helpful advice:

- Don't worry about editing out the "ums" and pauses. Voice comments are just the same thing that you would say to a student on the phone or in person. We do not worry about editing out our "ums" or other linguistic pauses or self-correcting when we speak, so don't do it in a voice comment. Just record what you want to say to the student and give them the unedited version.

- Federal law requires that schools make "reasonable accommodations" for students who have identified themselves as having a disability. It is best to tell your students that you will be using voice comments in your welcome letter. Any students who have a hearing problem can then request that you go back to using text comments with them. You can even use voice recognition software, like Dragon, to convert your voice to text. In fact, some people prefer to use voice recognition software to dictate all of their text documents, and so you might find it a time-saving convenience anyway.

- A sound file should play on any computer with speakers. Make sure to use either MP3 or WAV files, which are general enough to be understood by any system.

Providing voice feedback

There are two ways to provide voice feedback to students. The first is to embed the comments directly into the student's assignment. The second is to record the comments to a cloud-based sound repository and then provide the student with a link to that file for them to play online. This tutorial covers both methods.

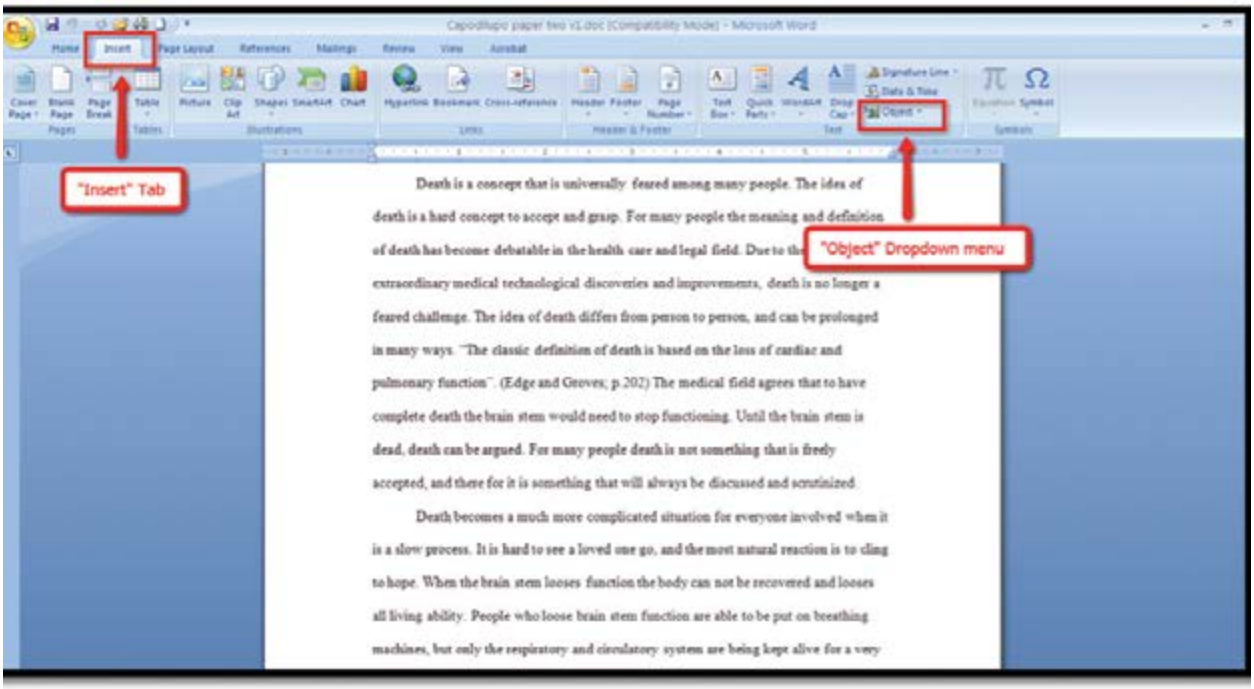
It was possible to record voice directly into a document using Word 2003 and early versions of Word 2007. But that capacity was removed in later versions of Word 2007 and onwards. As a result, if you have one of the later versions of Word, you need to first record your comments on outside software, and then attach that file to the document. We are going to cover both methods here.

The information below is also covered in this tutorial on how to record and embed voice comments into students' work.

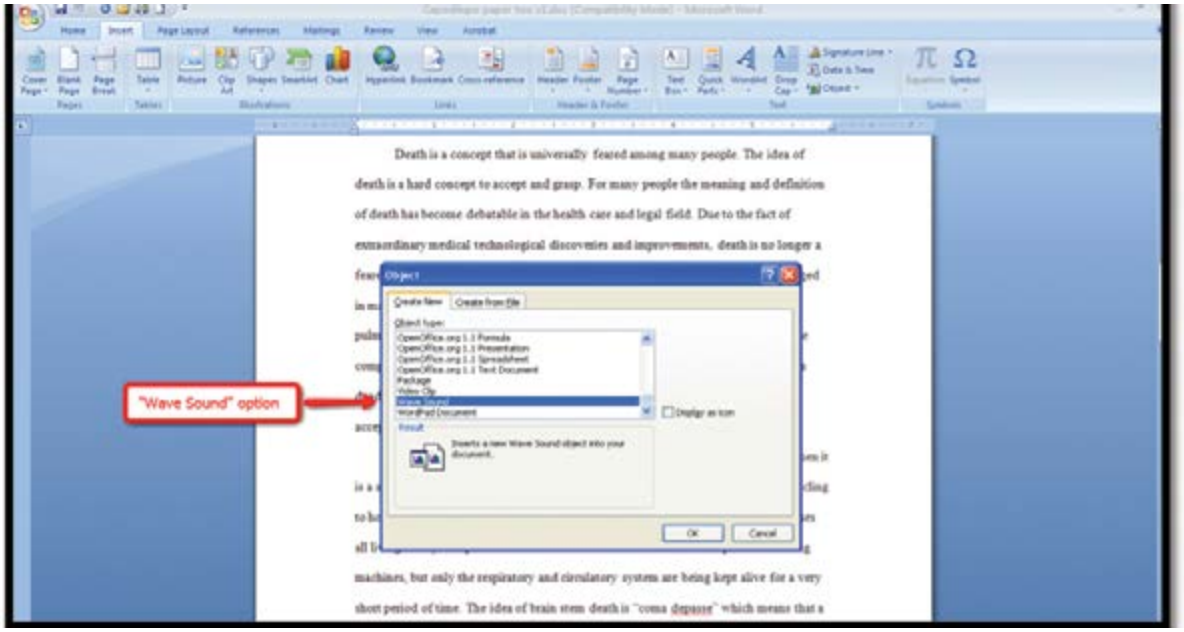
You might also wish to provide screencasting feedback on students' work, which adds a visual element to your voice feedback. Here is a tutorial on how to provide screencasting feedback with Screencast-O-Matic, an inexpensive but very powerful cloud-based tool for creating and hosting screencasts.

Word 2003 or early versions of Word 2007

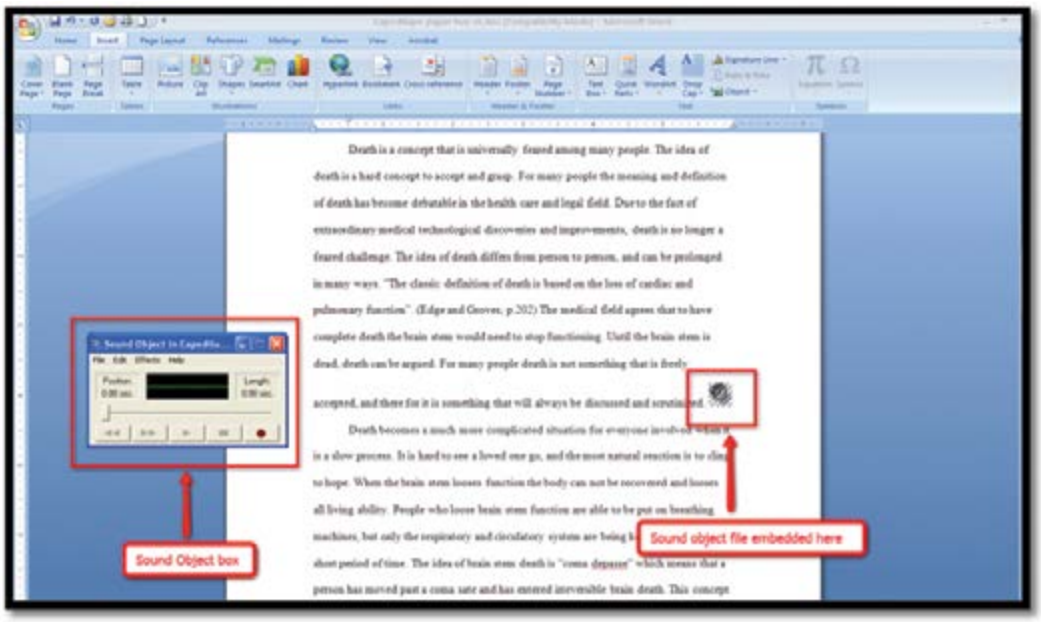
1. Open the document in Word.
   a. Left-click the location on the document where you want to insert the voice file.
   b. Click the "Insert" tab.
   c. Choose the "Object..." option from the "Object" dropdown menu.



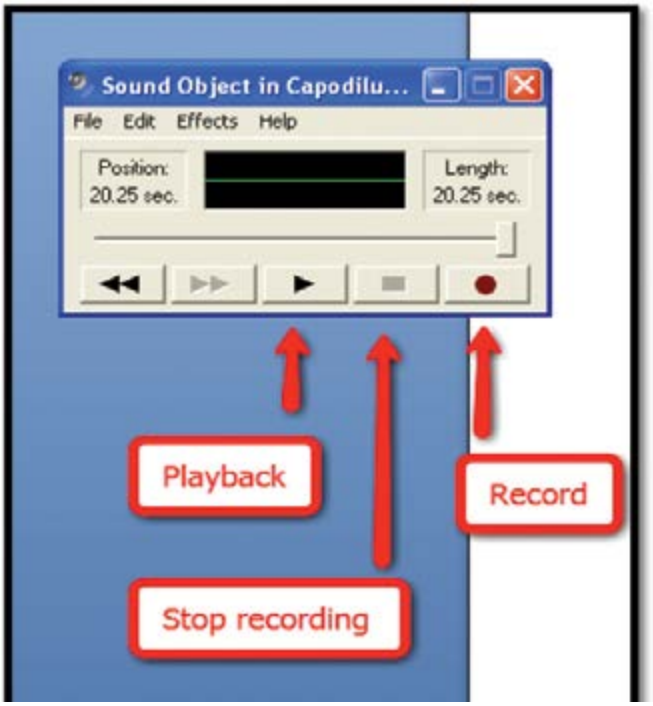
2. If "Wave Sound" appears in the dialog box, then highlight it and click "OK." If "Wave Sound" does not appear, then you do not have this function, and you will need to follow the process described in the next section.



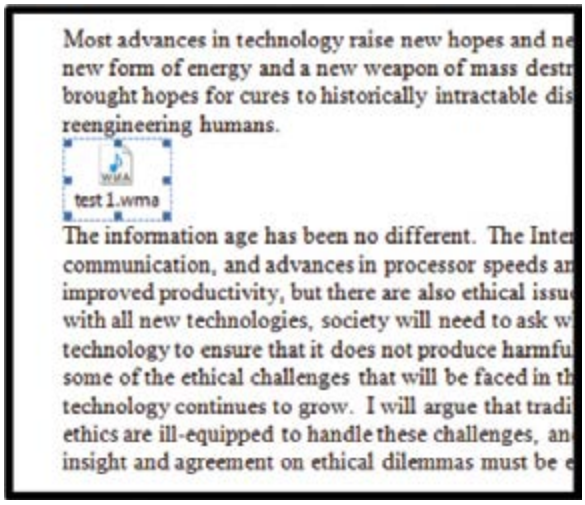
3. A “Sound Object” dialog box will open.
   a. A speaker icon will show up at the location of your cursor to indicate where the sound file will be embedded.



4. Record your voice.
   a. Click the button with the red circle to start recording.
   b. Click the button with the black box to stop recording.
   c. Click the single arrow if you wish to play back the recording. You can always rerecord.

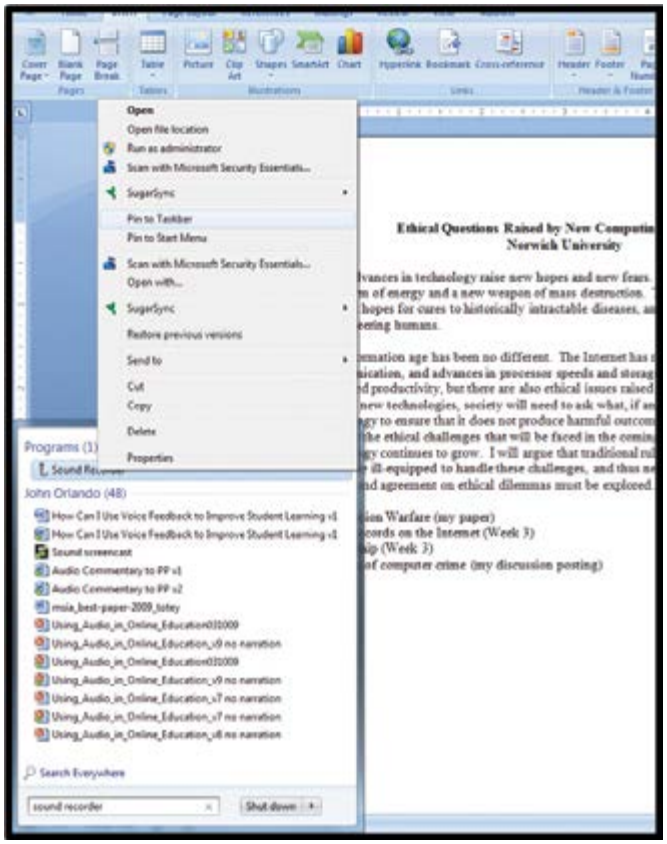


d. The voice file will appear as an icon within the document. Note that you can grab and move the icon around the document. The student will play the voice file by clicking on the icon.

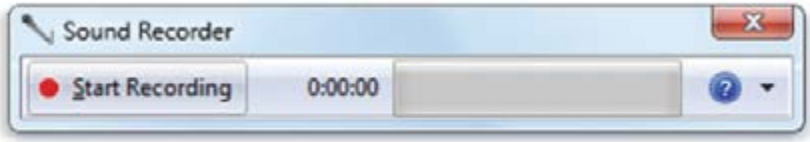


Later versions of Word 2007 and onward

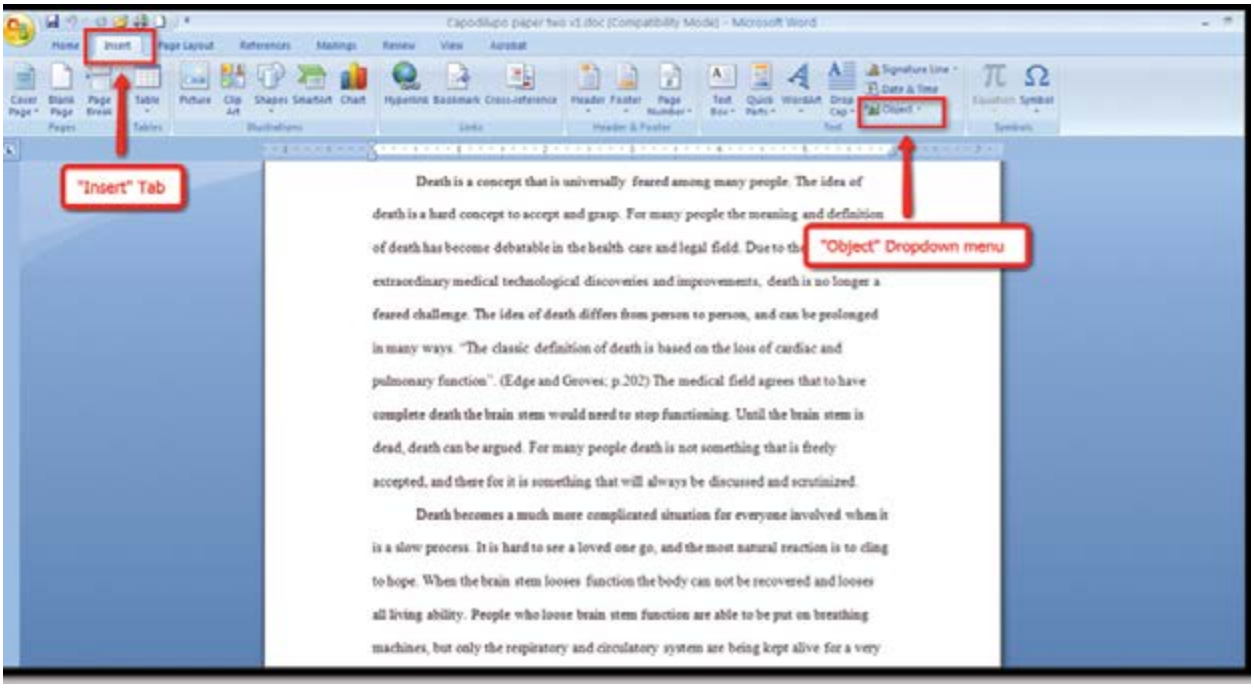
1. Put ***Sound Recorder*** onto your Taskbar to make it easier to reach while in Word.
   a. Click the "Start" globe at the bottom left of the taskbar.
   b. Search for "Sound Recorder" in the program search field.
   c. Right-click the Sound Recorder program.
   d. Click "Pin to Taskbar."



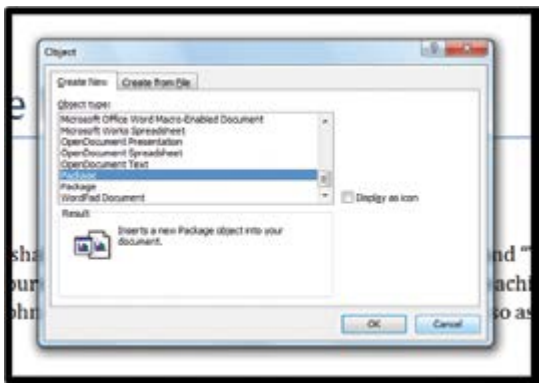
2. Record with Sound Recorder.
   a. Click the Sound Recorder icon to open.
   b. Click “Start Recording.”
   c. Click “Stop Recording” when done.
   d. Save the file.



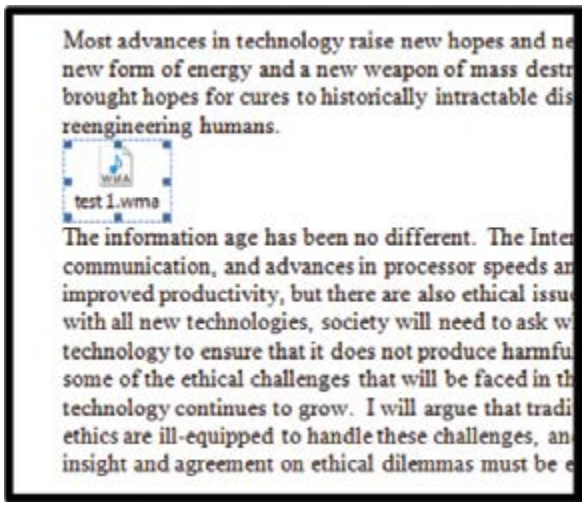
3. Open the word document in MS Word.
   a. Left-click the location on the document where you want to insert the voice file.
   b. Click the “Insert” tab.
   c. Choose the “Object...” option from the “Object” dropdown menu.



4. An “Object” dialogue box will open, as shown below.
   a. Choose “Package.”
   b. Click “OK.”
   c. Browse for the voice file.
   d. Click “OK” to insert it into the document.



5. The voice file will appear as an icon within the document. Note that you can grab and move the icon around the document. Students play the voice file by clicking on the icon.



Recording in the cloud

A second method for providing voice feedback is to record the comments onto a sound website such as Vocaroo, audioBoo, AudioPal, Record MP3, or Soundcloud, and provide the student with a link to the file. The process for using Vocaroo is as follows:

1. Go to Vocaroo.

2. Create the recording.
   a. Click "Click to Record" and record your voice.
   b. Save your recording.
   c. Copy and paste the link you are provided into the student's assignment for them to click.

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