Improving Student-Teacher Relationships Through Feedback: The Development and Evaluation of the Stanford/Leading Educators Wise Feedback Professional Development Learning Series

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High-quality academic feedback, especially feedback that highlights errors, mistakes, misunderstandings and shortcomings, is one of the most valuable tools teachers have for promoting student growth and learning. It is how teachers help students go beyond what they could accomplish on their own (Vygotsky, 1978). It is unsurprising, then, that high-quality feedback is an emphasis of many leading educational organizations.

However, providing effective feedback can also pose significant challenge for both givers and receivers. Sometimes, teachers avoid giving negative feedback to protect students' feelings. Sometimes receiving critical feedback can sting. Then students may disengage from the very resource that could help them learn.

Inspired by innovative educators, the science of "wise feedback" has revealed a solution. Past laboratory and small-scale field experiments show that, when students understand critical feedback as a reflection of a teacher's high standards and belief in their potential to meet those standards, the benefits for student learning and growth, and for teacher-student relationships, can be transformative.

What is needed to take these insights to scale is an efficient means to equip teachers with an understanding of the psychological dynamics that underlie the feedback exchange and how they can put this understanding to work with their students. The Stanford/Leading Educators Wise Feedback Professional Development (PD) Learning Series integrates hard-earned wisdom from educators with psychological theory and research to formalize and clarify the key constructs at play in the feedback exchange and a set of concrete strategies for delivering critical feedback that builds trust with students, promotes student engagement and motivation, and ultimately improves academic outcomes. The strategies emphasized in this learning series benefit all students, but can be especially helpful for students from historically marginalized backgrounds in education, for specific reasons we will discuss.

We describe the Wise Feedback PD Learning Series, including relevant theoretical background and the iterative design process we have used to develop and evaluate it. We then describe learnings from the largest deployment to date, along with follow-up steps and future directions.

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Overview

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[1] Consider, for instance, EL Education's, "Austin's Butterfly": https://www.youtube.com/watch?v=E_6PskE3zfQ.

The Challenge of Delivering Critical Academic Feedback

Inspired directly by techniques honed by skilled educators, social psychologists have conducted decades of research to understand how teachers can provide critical feedback in ways that motivate and do not discourage students (Cohen et al., 1999; Cohen & Steele, 2002; Lepper et al., 1993; Yeager et al., 2014). A common challenge this research has revealed is that teachers and students often hold different representations of why a student receives critical feedback. Many teachers see feedback as a necessary part of learning. For them, giving feedback can be a sign of respect and belief in the student's ability to reach a high standard. But students can worry that they might be seen poorly, and entertain the possibility that critical feedback reflects a negative judgment on them or their abilities (e.g., "My teacher thinks I'm dumb."). When these concerns go unaddressed, they can undermine students' trust in teachers, motivation and engagement, and ultimately academic performance.

The challenges inherent in giving and receiving critical feedback are exacerbated when feedback is delivered across a group divide involving negative stereotypes. For example, students of color, students from low-income backgrounds, and women in STEM fields can all face negative stereotypes about their group's academic and intellectual ability. Mere awareness of these stereotypes can lead to experiences of stereotype threat (Steele et al., 2002), including worries about how one is seen by teachers, such as whether a teacher might be biased against one or could take a poor performance as proof of an offensive stereotype. These worries can come to a head when students receive critical feedback, making it that much harder to take in feedback in constructive, growth-oriented ways. The result is to cause students to miss out on learning opportunities available to students from majority groups, to interfere with student-teacher relationships, and ultimately to reinforce broader patterns of educational inequality (Cohen et al., 1999; Yeager et al., 2014, 2017).

For their part, teachers are often aware of the potential for critical feedback to discourage students. Out of a concern for students—or how they appear to students—teachers can temper critical feedback or even withhold it altogether, particularly when delivering feedback across group lines to students from historically marginalized backgrounds (Croft & Schmader, 2012; Harber, 1998, 2023; Harber et al., 2010, 2012). Regardless of the motivation, this is a huge disservice to students: It deprives them of the opportunity to learn and improve.

The fundamental problem is that the higher-level purpose or meaning of critical feedback can be unclear or ambiguous to students. This allows toxic representations of feedback to persist, including: "My teacher thinks I'm dumb" and "My teacher is biased against people like me." When left unaddressed, these representations lead to disengagement, reduced trust, and lowered performance. At the same time, teachers may hesitate to give the very feedback that could help students improve, especially to students from underrepresented backgrounds, further perpetuating educational inequities. To make matters worse, when teachers find students unresponsive to critical feedback but remain unaware of the worries that produce this lack of responsiveness, they may simply infer that students do not care about school.

The Stanford/Leading Educators Wise Feedback Professional Development Learning Series

1. What is "wise feedback"?
Wise feedback is an intentional effort to establish a shared understanding between teachers and students of the purpose of critical academic feedback as constructive and growth oriented. It might involve a teacher explicitly telling a student they are giving the student feedback because they believe in the student's ability and potential (e.g., "I am giving you these comments because I have high standards and I know you can meet them.").

2. How was the Wise Feedback Learning Series designed?
The learning series was developed using an iterative design process between 2018 and 2025 by a research team based at Stanford in partnership with the Advanced Placement Program at The College Board, with Equal Opportunity Schools, and with Leading Educators.

3. Who is the Wise Feedback Learning Series designed for?
Anyone who gives academic feedback to students, from kindergarten teachers through post-secondary educators. However, the materials may be most apt for those who teach adolescents and up, as issues of trust can come up more during this period of development.

4. What does the Wise Feedback Learning Series comprise?
The learning series includes a 45-minute online module introducing wise feedback, and a series of self-paced follow-up activities that reinforce the central ideas and support teachers in implementing wise feedback in their own classrooms. The learning series is designed for scale. Teachers can complete the entire learning series online autonomously and asynchronously.

5. How long does the Wise Feedback Learning Series take?
About 5 hours of teacher time, over 3-5 weeks.

Wise Feedback As a Solution

Wise feedback addresses these problems head on, by resolving the ambiguity surrounding feedback. It seeks to establish an explicit, clear, shared understanding of why a teacher gives a student critical feedback—namely, to tell the student that they (the teacher) have high standards for the student and confidence in the student's ability to meet that standard with feedback and further work. Wise feedback is "wise" in the sense that it is attuned to the (sometimes hidden) worries that students have when receiving critical feedback, particularly across a group divide, and seeks to proactively dispel those worries (Steele, 1997; Walton & Wilson, 2018). The goal is to sidestep the deleterious impact these worries can have on student engagement, motivation, trust, and performance.

Past work within social psychology has shown, in both rich laboratory experiments and ecologically valid field experiments, that wise feedback can enhance students' trust of teachers, their motivation and engagement in taking up learning opportunities, as well as their academic

success (Cohen et al., 1999; Yeager et al., 2014, 2016). When well-timed at the beginning of the school year, and during a developmental period when students' trust in teachers is at risk, even a single instance of wise feedback can sustain students' trust of teachers and improve their trajectory through schooling (Yeager et al., 2017). Moreover, because wise feedback can mitigate the harmful impact of negative stereotypes, it can be particularly beneficial for students from historically marginalized backgrounds. However, a significant limitation is that this past research has focused exclusively on student-facing interventions—how students make sense of feedback they receive. We sought to learn how to support teachers in implementing wise feedback in their own practices.

The Stanford/Leading Educators Wise Feedback Learning Series consists of an initial module to introduce the concept of wise feedback to teachers and several follow up exercises to support teachers in incorporating wise feedback in their own practice on an ongoing basis. These follow up exercises aim to promote two primary goals: (1) to initiate open dialogue between students and teachers about the purpose of critical feedback, namely to encourage teachers to tell students explicitly that receiving critical feedback means that they (the teacher) believes in the student and holds them to a high standard; and (2) to help teachers establish clear classroom norms surrounding the meaning of feedback, namely reflecting as positive and growth-oriented understandings of the student.

Goals of This Report

In developing the *Stanford/Leading Educators Wise Feedback PD Learning Series,* we translate past experimental work into a real-world professional development opportunity that, we hope, can create sustained change, by shifting teachers' behaviors and practices in ways that effectively disabuse students of worries that they are seen in poor regard or held to a lower standard. Focusing on teachers' behavior as compared to students' can exponentially increase impact, by potentially improving the outcomes of all students teachers teach (Hecht et al., 2023; Okonofua & Ruiz, 2021).

In the present report, with a primary focus on the Full Pilot conducted in the Spring of 2023, we use (a) observational methods to explore teachers' engagement in each step of the learning series and evaluation of the learning series as a whole, and (b) pre-post methods to explore changes in teachers' confidence in their ability to give students critical feedback in ways that keep them motivated and their understanding of wise feedback.

We then back up to describe the iterative design process we used to develop and refine the learning series. We also report experimental methods deployed in this design process, which show that the learning series can increase teachers' awareness of the role that mistrust and worries caused by negative stereotypes can cause in reducing student engagement from critical feedback.

Finally, we discuss the opportunity for the learning series to improve teacher-student relationship quality; students' trust of teachers, sense of belonging in school, engagement and motivation in class; and students' academic outcomes, particularly students from historically

marginalized backgrounds, and methods that may allow collaborations between researchers and educators to assess these potential benefits over time.

<p align="center">Spring 2023 Full Pilot</p>

In May of 2023, we conducted a full pilot of the *Stanford/Leading Educators Wise Feedback Professional Development Learning Series*—the largest and most complete pilot of the learning series to date. The learning series consisted of five steps: an introductory module that explained wise feedback and four follow-up exercises that supported teachers in implementing wise feedback in their classrooms. A primary feature of this pilot is that it was designed for scalability, as it allows for autonomous and asynchronous participation, an innovation upon earlier pilots. Teachers progressed through the learning series by referencing weekly emails and a detailed agenda with instructions for completing each step.

The goals of the pilot were (a) to explore the utility and impact of the learning series as described above through both quantitative and qualitative data and (b) to test the viability of the autonomous and asynchronous multi-step format. Ultimately, this pilot served as a proof-of-concept test demonstrating that the *Wise Feedback PD Learning Series* can be effectively delivered to teachers in a scalable format.

Detailed Methods and Results

Recruitment. Participants were 4th – 12th grade teachers recruited through an email sent to over 900 teachers from the Leading Educators alumni network. The email invited teachers to join a research project where they would pilot an online professional development learning series focused on helping students learn from critical feedback. Teachers were told that the learning series included 5 tasks that would take about 5 hours of their time across 3-5 weeks. They were offered a $200 Visa gift card as compensation for completing the learning series.

The recruitment email directed teachers to an application survey hosted on Qualtrics. A total of 44 teachers entered the application survey. Of these, 36 teachers completed the application. All teachers who completed the application were invited to participate in the full learning series.

Participants. Our starting sample comprised 36 teachers who taught grades ranging from 4th grade to 12th grade. Teachers taught a variety of subjects including, Math, Science, English/Language Arts, Social Sciences, Spanish, Art, and more. For demographics and teaching contexts, see Table 1.

Table 1. Demographics and teaching contexts of teachers in the Spring 2023 Full Pilot.

Measure		Mean (SD, range)/%
Years of teaching experience		13.33 (7.91, 1-30)
Race-Ethnicity	Black or African American	11%
	White or European American	83%
	Multi-Racial	3%

	Did Not Disclose	3%
Gender	Female	81%
	Male	11%
	Other	8%
School Type	Private School	11%
	Public District School	56%
	Public Charter School	31%
	Other	3%
Region	Midwestern United States	56%
	Southeastern United States	31%
	Western United States	14%
Racial-Ethnic Makeup of Student Body	American Indian/Native American or Native Alaskan	0.30% (0.64%, 0-2%)
	Asian or Asian American	6.11% (7.16%, 0-24%)
	Black or African American	32.06% (34.02%, 0-100%)
	Hispanic or Latino	26.01% (26.39%, 0-100%)
	Native Hawaiian or Other Pacific Islander	0.52% (1.24%, 0-5%)
	White or European American	35.45% (29.08%, 0-90%)
	Multiracial	5.13% (4.74%, 0-20%)
	Other	4.71% (11.18%, 0-30%)
Percent of Student Body Qualified for Free or Reduced Lunch		71.42% (28.87%, 5-100%)

Note. All data come from teacher self-reports.

Procedure Overview. All teachers who completed the application survey were sent an email officially welcoming them to the *Stanford-Leading Educators Wise Feedback Research Pilot*. The email described the learning series and included a link to an agenda that contained all the information necessary to complete it. The learning series was divided into 5 steps, which teachers were asked to complete in order: as follows:

Step 1: Complete an hour-long online module about wise feedback.
Step 2: Plan and administer a survey to students about receiving critical feedback.
Step 3: Review student survey results, then plan and hold a class discussion about critical feedback.
Step 4: Review class discussion, then plan and implement ongoing wise feedback practices, including with individual students.

Step 5: Review ongoing implementation efforts, then complete an exit survey to evaluate the learning series.

Teachers were told they could complete the steps according to their own schedule, or at a suggested pace of one step per week. On the Friday of each week, teachers received an email that introduced the next step in the learning series and provided instructions for how to complete it. A reminder email followed the next Tuesday. While these scheduled emails supported the recommended pace through the learning series, the initial email gave teachers all the necessary information to complete each step allowing teachers to move through the learning series more quickly if they chose, which many did.

Next, we describe the contents of each step and key observations from each.

Step 1 – The Wise Feedback Module

Procedure. The first step of the learning series was for teachers to complete an hour-long online module about wise feedback. The module introduced teachers to the concept of wise feedback by explaining the problem it seeks to address—the worries students can have about how they are seen by their teacher when they receive critical feedback, including how these worries can be pronounced among students from historically marginalized backgrounds in education, such as students of color, low-income students, and women in STEM fields. It also explains how these worries can subsequently lead to disengagement in response to critical feedback. The module goes on to introduce wise feedback as a solution to this problem. It defines wise feedback as explicitly explaining *why* you are providing a student critical feedback and doing so in a way that attributes the feedback to your belief in the student's ability to reach a high standard. To help explain the idea, teachers were given the wise feedback equation shown in Figure 1.

Figure 1. The Wise Feedback Equation.
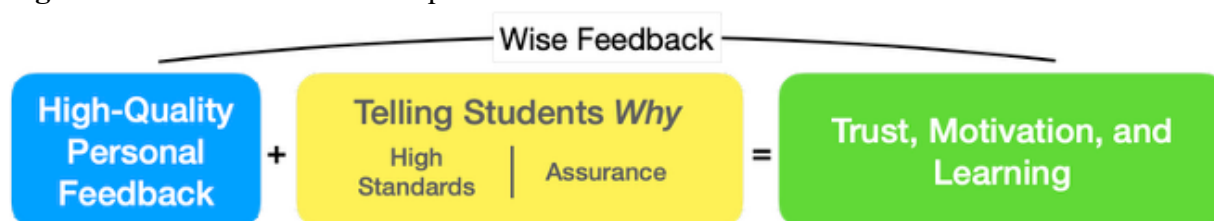
The module describes the history of insights into wise feedback, beginning with innovative educators (e.g., Jaime Escalante, depicted in the film *Stand and Deliver*), and the research these educators inspired to isolate wise feedback and test its effectiveness in increasing student motivation and engagement, trust, and performance. In the last part of the module, teachers work through several prompts and exercises about how to implement wise feedback in their own classrooms. See Appendix for sample pages from the module.

Throughout, the module is interactive and treats teachers as skilled and motivated in supporting their students as well as having expertise to share with other teachers, following the methods of psychologically "wise" interventions (Walton & Wilson, 2018). For instance, teachers are asked open-ended "saying-is-believing" questions to encourage them to reflect on

their goals in giving students' feedback, their beliefs about students' worries about feedback, how they do and can best use wise feedback, and advice they would share with other, younger teachers. Teachers are told that we were soliciting their responses in order to learn from them: that their responses would be used to improve the module and help future teachers better understand wise feedback. By explicitly including teachers in the continuous development of the module, we sought to affirm and honor their expertise, boost engagement, and increase their sense of agency and ownership in incorporating wise feedback in their practice, as well as to remove any sense of remedial training. Thus, the open-ended exercises served many functions: to provide an opportunity for teachers to reflect and elaborate on what they were learning, facilitating active learning and personalization; to provide an opportunity for teachers to give their input on the ideas discussed in the module so as to improve it; and to allow us to learn how they were reacting to the module and understanding wise feedback.

In addition to the open-ended questions, at the end we included several close-ended measures. These assessed whether teachers reported having learned something meaningful or significant (yes or no), their evaluation of the module as a useful learning experience (*1 – Not at all useful*, *5 – Extremely useful*), and their likelihood of recommending the module to a friend or colleague (*1 – Not at all likely*, *10 – Extremely likely*).

Results. Of the 36 teachers invited to participate in the learning series, 33 began the module and 27 completed it. The analysis below includes the 27 teachers who completed the module.

Closed-ended measures. Overall, teachers evaluated the module quite positively. Teachers' mean assessment of the usefulness of the module, 4.00, corresponds to "very useful." See Table 2.

Table 2. Teachers' evaluations of the wise feedback module in the Spring 2023 Full Pilot.

Measure	Mean (SD)/%
Did you learn anything meaningful or significant? (% yes)	93%
How useful was the module? (1-5 scale)	4.00 (0.83)
How likely would you be to recommend the module to a friend or colleague? (1-10 scale)	8.50 (2.03)

Open-ended responses. As noted, many of the open-ended questions were designed as "saying-is-believing" exercises that invite teachers to rearticulate central ideas from the module in their own words, to help future teachers. We adopted this strategy as it can help participants connect abstract ideas to their own experience while treating people in positive, asset-based ways rather than as receiving remedial treatment (Walton & Wilson, 2018). In analyzing these responses, we sought to understand how effective these questions were at eliciting productive responses from teachers and to learn how teachers think about feedback in response to the content presented in the module.

Overall, we found that in general, the open-ended questions in the module were effective. For instance, in a question that asked teachers to reflect on why they give feedback to their students, 96% of teachers mentioned learning or growth as a primary reason. In a question that asked teachers to reflect on students' experience receiving critical feedback, 63% mentioned issues of trust, relational worries, or worries about how they are seen as anxieties that students can have when receiving critical feedback. Many teachers added that these worries can be the source of disengagement. In another question, 82% of teachers explicitly stated that explaining why you are giving a student critical feedback is an important aspect of delivering critical feedback.

Another question asked teachers what they would say in a note on a student's assignment they were returning. We coded teachers' responses for whether the note met the criteria for wise feedback—that is, if it explicitly explained why the feedback was being provided and attributed this feedback to high standards and the teacher's belief in the student's ability to meet it. A total of 55% of responses clearly met these criteria, an improvement over earlier iterations (see Figure 2). (We also suspect that the complexity of the instructions in this section of the module, which may have implied to teachers that they needed to be creative in their notes rather than draw on the provided language, reduced this figure.)

In sum, analysis of the open-ended questions strongly suggest that the vast majority of teachers endorsed the intended message and reflected on how they could integrate wise feedback into their practice. See Table 3 for sample responses.

Table 3. Sample responses to open-ended questions in the module.

"The explanation matters because it explicitly tell[s] students your motives and demistifies [sic] the intentions of the feedback. When we give explicit rationale for our feedback, we are assuring students we believe in them and their abilities in our class. This builds trust between the teacher and the students and encourages the student to believe in themself. I also believe it gives students the courage to take academic risks in the future because they know the teacher has their back, believes in them, and will ultimately support them on their learning journey."
"Students need to buy into why you are giving them feedback. They quickly see through phony praise, but when feedback is framed with the teacher setting high standards for them to reach, and providing help in reaching them, the feedback becomes a sign of high respect for every student. They respect that the teacher took the time to explain and make it something worth attaining."
"Most students will value anything as long as they understand the reason why something is happening in school. If you want them to value and use your feedback, its [sic] necessary for them to understand why you're giving it to them. We make the assumption they know this, but if no one has ever told them, why would they?"

Take away. Overall, it appears that the module is effective in communicating the central ideas of wise feedback and in inviting teachers to incorporate wise feedback into their practice. Additionally, teachers clearly liked and valued the module as a professional development

experience. The positive reception of the module provides a strong foundation for the remainder of the learning series.

Step 2 – Student Survey About Feedback

The second step of the learning series was for teachers to distribute a survey to their students asking about students' perception and beliefs about critical feedback. The goal of the survey was two-fold: First, it invited students to begin to reflect on the purpose of critical feedback. Second, it allowed teachers to hear student's perspectives and learn from their experience. Ultimately, wise feedback seeks to get students and teachers on the same page about what it means to give and receive critical feedback. The student survey aims to jump start this process by directly involving students in the reshaping of how feedback is understood, rather than taking a top-down approach that begins with only the teacher.

Procedure. Teachers received a link to a student survey (hosted on google forms) unique to them. Their task was to send this link to their students and ask them to complete the survey. Instructions included suggested text for introducing the survey to students, and a brief worksheet to help teachers plan when and how to distribute the survey.

The worksheet described the student survey as a way to begin a conversation with students about the role of critical feedback in the classroom. Teachers were told that they would receive a report of the student responses they could use to plan both a class discussion and one-on-one conversations with students. In the planning worksheet, teachers were asked to indicate which of their classes they would send the survey to, when they would distribute the survey, how they would distribute it (e.g., over email vs. in class), and how they would introduce it.

The opening page of the survey told students that they were receiving the survey because their teacher wanted to learn more about how students think about receiving critical feedback on their work. They were told that the survey would take between 5-10 minutes and that it was being conducted by researchers at Stanford University and Leading Educators. The instructions emphasized that they did not have to take the survey if they did not want to and that their answers would remain completely anonymous, including to their teacher.

After completing a consent form and identifying the name of the teacher who sent them the survey, students were asked several questions about receiving critical feedback in that teacher's class: what kind of feedback they received in the class, how often they received feedback, how much they paid attention to the feedback they received, and three questions (2 scales and 1 open-ended question) about why they thought their teacher gave them critical feedback on their work. Next students were asked how helpful the feedback they received from their teacher was, whether they wanted their teacher to give them feedback that helps them learn, whether they thought their teacher believes in their ability to succeed in school, and whether their teacher lets them know that they believe they can do well in class. Finally, students were asked to indicate their race/ethnicity and their gender.

Results. Twenty-four teachers completed the planning worksheet, all of whom had at least some students complete the survey. On average, each teacher had 26.38 students complete the student survey ($M = 26.38$, $SD = 21.12$, *range:* $4 – 38$).

Planning worksheet. Inspection of teachers' responses to the planning worksheet prompts reveals that many teachers found the suggested text for introducing the student survey helpful. When asked what they would say to introduce the student survey, many teachers drew directly on this text, and many explicitly said that having this text was a helpful scaffold. In the planning survey, teachers were also asked whether they would distribute the survey during class or as homework. All said they would introduce and distribute the student survey during class.

Intercorrelations among student survey response measures. First, we found that the more often students reported receiving critical feedback, the more (a) they reported paying attention to this feedback ($r = .19$, $n = 629$, $p < .001$), (b) the more helpful they found it ($r = .40$, $n = 621$, $p < .001$), and (c) the more they felt their teacher believed in them ($r = .34$, $n = 621$, $p < .001$). These results suggest that students value receiving good feedback and can understand that feedback can be a sign of belief in the student's potential.

Consistent with these correlations, students' open-ended responses often emphasized their belief that feedback could help them learn. Students wrote that teachers gave feedback, "To help me reach my full potential in the class," "to help me improve and become a better student," and "My teachers give me feedback because they care about my learning and strive to help me get better." Interestingly, students were less apt to interpret critical feedback as a reflection of high standards and the teacher's belief in the student's ability to meet these standards. Students' responses may reflect a predominant baseline understanding of feedback as aiming primarily to remedy deficiency.

Second, we found that the more students felt their teacher believed in them the more students reported paying attention to the feedback they received ($r = .26$, $n = 623$, $p < .001$) and the more they reported wanting to receive feedback that helped them learn ($r = .27$, $n = 622$, $p < .001$). Similarly, students' endorsement of the statement, "My teacher lets me know they believe I can do well in class," predicted their desire to receive feedback ($r = .21$, $n = 597$, $p < .001$).

While correlational, these associations are consistent with the central idea of wise feedback: When students know and trust that their teacher believes in them, they value and utilize the critical feedback their teacher provides to learn.

Table 4. Correlations between students' responses to questions about receiving feedback from their teacher and their perception of teachers' belief in them from student survey.

	2	3	4	5	6
1. Frequency Receiving Feedback On Your Work	.19	.40	.34	.21	.31
2. How Much Pay Attention to Feedback	-	.47	.26	.29	.19
3. How Helpful For Learning and Improving		-	.45	.38	.43

4. Think Teacher Believes in My Ability to Succeed			-	.27	.41
5. How Much Want Feedback That Helps Me Learn				-	.21
6. Teacher Lets Me Know They Believe I Can Do Well					-

Note. All correlations (*r*) are significant *ps* < .001.

One additional finding was noteworthy. There was not a significant correlation between classroom averages of students' reports of whether they knew why their teacher provided critical feedback and teachers' reports in the application survey of either how confident they were that their students knew why they provided critical feedback ($r = -.27$, $n = 24$, $p = .20$) or how important they believed it was to explain the reasons behind feedback to students ($r = -.06$, $n = 24$, $p = .78$). These results suggest a possible failure of communication between teachers and students. It may be easy for teachers to take for granted that their students know the positive, growth-oriented reasons behind their critical feedback but not communicate this clearly to their students. Improving communications to as to get teachers and students on the same page is a fundamental goal of the *Wise Feedback Learning Series*.

Take away. While the student survey provided revealing data, its primary purpose was to give students an opportunity to reflect on and communicate their experience and beliefs about critical feedback to their teacher and, thus, to begin a dialogue between teachers and students about the purpose and meaning of critical feedback.

Step 3 – Student Survey Review and Plan for Class Discussion

The third step of the learning series had two parts. First, teachers received an aggregated report of their student survey results, including a table of their anonymized students' open-ended responses. Second, teachers were asked to plan and hold a class discussion about critical feedback. The goal of the class discussion was to help set constructive norms in the classroom surrounding feedback—namely, that feedback should always be understood as a sign that your teacher holds you to a high standard and believes in your ability to meet it. A worksheet hosted on google forms supported teachers in planning this discussion.

Procedure. In the first part of the worksheet, teachers were asked about their students' responses regarding the purpose of critical feedback: To summarize in an open-ended format what their students were saying overall, whether their students appeared to know why they gave feedback, and whether their students recognized their high standards and belief in them. Next, teachers were asked several questions designed to help them appreciate the variety of students' responses: To find a response that was exciting or encouraging to them, one that was concerning, and one that was interesting and they had further questions about. Finally, teachers were given space to reflect on these responses: To write what they were learning from reading students' responses, what was revealing or useful for them to hear, what responses they thought could be useful for other teachers to be aware of, what responses they wished they could directly respond to, and whether they had any additional thoughts.

The second part of the worksheet asked teachers to plan a class discussion about critical feedback, emphasizing why they give critical feedback. The worksheet reminded teachers of the

wise feedback equation (High quality personal feedback + Telling students why through both high-standards and assurances) using graphics from the *Wise Feedback Module* (see Figure 1). Then, it prompted teachers to state their objective for holding a class conversation, to plan how they would lead the conversation including what questions they would ask and how they would explain the purpose of critical feedback to their students, and to self-assess whether their plans met the criteria for wise feedback (i.e., Did it explain why they give feedback? Did it include references to high standards and assurance that students can reach those standards?). Next, teachers were asked to decide when they would hold the class discussion and how much time they would spend on it. Finally, teachers were given space to elaborate on any additional thoughts they had or notes they wanted to make for themselves.

Results. Twenty-three teachers completed the Step 3 review and planning worksheet. Overall, the review and planning worksheet for Step 3 appears to have been effective at guiding teachers to reflect their student survey responses and plan the class discussion. In general, teachers seemed encouraged by the responses they saw from their student survey but also were able to extract lessons for improvement in their feedback practices. For instance, in response to a question about what they learned from the student survey, one teacher said,

> *Students view my feedback as a personal reflection of my care for them specifically. This is not a bad thing, but I want to be clearer next year that it is also about me having high expectations and I want their understanding of feedback as a tool for growth to extend beyond my class.*

This sentiment was echoed by numerous teachers who similarly stated that, although their students often see feedback as growth-oriented, there was room for them to be more clear and explicit in attributing feedback to their high standards and belief in students' ability to meet those standards. On the whole, teachers found the student survey and the report to be useful and appreciated the opportunity to hear from their students.

In planning the class discussion teachers were highly engaged. Almost all teachers indicated that they would lead the conversation by asking students questions about why they thought they themselves and other teachers provided feedback or by alluding back to the student survey. Several mentioned that they would show students aggregated charts of students' responses to the student survey to seed discussion. All teachers specified when they would have the conversation (either the date, time, or both) and how long they would spend on it. The structuring and logistics prompts appear to have provided an effective scaffold to help teachers plan when and how to carry out the class discussion.

After completing the review and planning worksheet, teachers were tasked with actually holding the class discussion. They reported on their experience doing so in Step 4.

Step 4 – Review of Class Discussion and Planning Ongoing Implementation

The fourth step of the learning series also had two parts. First, teachers were asked about their experience holding the class discussion. Second, they were asked how they planned to continue to practice wise feedback in their classroom.

   Procedure. Teachers were provided with a link to a worksheet, hosted on google forms, with instructions for each part. The first part of the worksheet asked teachers if they did indeed hold the class discussion, when they held it, and with which class(es). Then teachers were asked several open-ended questions about how the discussion went: To recap the conversation, how it began, what they said, and what students said; whether they explained the purpose behind their feedback and clearly communicated high standards and assurance; and whether they met the goals for the conversation they outlined in Step 3. Next, they were asked what their experience holding the conversation was like and whether it helped move them towards their own personal goals as a teacher. Finally, they were asked what advice they would give to other teachers about having a conversation like this.

   After these questions, teachers were asked a series of closed-ended questions to evaluate their experience. They were asked to report how well they thought the class discussion went (*1 – Very Poorly*, *5 – Very Well*); if they thought that having the discussion helped their students understand feedback in a more constructive and positive manner (*1 – No, it did not help at all*, *4 – Yes, it helped a lot*); how likely they were to have a similar class discussion about feedback with future classes (*1 – Not at all likely*, *5 – Very likely*); how they would rate their experience holding the class discussion (*1 – Very negative*, *5 – Very positive*); how valuable they thought the class discussion was for helping them accomplish their goals as a teacher (1 – Not at all valuable; 5 – Extremely valuable); and how likely they were to recommend having a class discussion like this to a friend or colleague (*1 – Not at all likely*, *10 – Extremely likely*).

   After reviewing the class discussion, the worksheet invited teachers to plan their continued practice of wise feedback. First, teachers were reminded of several ways that they could communicate wise feedback, including by having personal conversations with students, by adding framing notes to written feedback, by improving the amount and quality of their feedback to help students learn and grow, and by talking with the class further to reinforce norms around the purpose of critical feedback. Next, teachers were asked several open-ended questions about their plans: Which approaches they would use, what they hoped to accomplish, who they would reach out to (e.g., an individual student or students, or the whole class), what they would say or do, and when they would do it. Finally, they were given space to elaborate on any additional thoughts they had.

   Results. All 23 teachers who completed the Step 3 class discussion planning worksheet reported that they did indeed hold the class discussion.

   Class discussion: Open-ended responses. Nearly all teachers reported that the conversation went well, that they explained the purpose behind their feedback to students, that they successfully communicated high-standards and assurance, and that they met the goals they had set for the conversation in Step 3.

   When asked to reflect on their experience holding the conversation, many teachers mentioned how valuable it was for them to be able to show students that they cared about their opinions and perspectives. For instance:

   "I loved getting the chance to remind them their opinions are valid and worthy as well."

> *"We are a partnership, and they know I value their input. This in turn will establish their value of my input, I hope."*

Relatedly, many teachers spontaneously mentioned how these conversations were exercises in receiving feedback themselves. One teacher said, "It was helpful modeling for them how I was listening to their feedback on my class." This observation resonates with an observation in previous pilots, where teachers there too described becoming more receptive to soliciting and listening to feedback from students. It appears that the reflection on critical feedback helps teachers consider their own experience receiving critical feedback and shifts their own responses to feedback to be more constructive. This is encouraging as it opens the door for teachers to improve their own teaching and their relationships with students. We are also hopeful that teachers' modeling of non-defensive responding to critical feedback will encourage students to do the same.

Another notable finding from the open-ended responses is that many teachers said how they would carry on the practice of holding class discussions forward with future classes. One teacher had a particularly interesting idea for how to do so. They said that they had their students write letters explaining the standards of the class—including its high standards—to next year's students. The teacher highlighted this as a way to set the bar high for next year's students. They said they planned to do this every year. Adoption of strategies such as this may kick off recursive processes that cement the incorporation of wise feedback into teachers' classrooms over time.

Class discussion: Close-ended responses. Overall, teachers had very positive experiences holding the class discussion. The vast majority (91.1%) said that the conversation went well (60.9% said it went "Very well," 30.4% said it went "Somewhat well," and none said it went poorly). The vast majority (95.7%) rated their experience holding the class discussion as positive (one teacher, 4.3%, rated it as "Neutral.") All said that having the class discussion helped students understand feedback in a more constructive and positive manner (43.5% said it "Yes, it helped a lot," 43.5% said "Yes, it helped a fair amount," and 13% said "Maybe it helped a little bit"). All reported that they were likely to have similar discussions with future classes (82.6% said they were "Very likely," 17.4% said that they were "Fairly likely"). All reported that the discussion was valuable for helping them accomplish their goals as teachers (43.5% said it was "Extremely valuable," 47.8% said it was "Very valuable," and 8.7% said it was "Somewhat valuable"). Finally, teachers overwhelmingly endorsed this kind of class discussion to a colleague or friend. See Table 3.

Table 5. Teachers' evaluations of the wise feedback class discussion in the Spring 2023 Full Pilot.

Measure	Mean (SD)
Overall evaluation (1-5 scale)	4.52 (0.67)
Quality of their experience holding the conversation (1-5 scale)	4.48 (0.59)
Helped students understand feedback in a more constructive manner (1-4 scale)	3.30 (0.70)

Likely to have a similar conversation with future classes? (1-5 scale)	4.83 (0.39)
Value for helping accomplish goals as a teacher (1-5 scale)	4.35 (0.65)
Likely to recommend to a friend or colleague (1-10 scale)	9.52 (0.79)

Class discussion: Take away. In sum, teachers found the class-wide discussion valuable for both themselves and their students. The overwhelmingly positive response suggests that the class discussion, in tandem, with the student survey is a critical aspect of the learning series.

Plan for ongoing implementation. Two notable themes emerged from analyzing teachers' open-ended responses regarding their plans for ongoing implementation. First, many teachers mentioned personal conversations as a primary way they wanted to continue implementing wise feedback. Several named individual students or groups of students they wanted to reach out to specifically. Second, many teachers wrote about plans for incorporating wise feedback into their practice in the next academic year. While this reflects forward thinking and intentions to continue practicing wise feedback in the future, it also suggests a limitation in implementing the learning series toward the end of the school year. Several teachers expressed a desire for additional time with students to try out continued practices. Future implementations may benefit from delivering the learning series earlier in the school year. Nonetheless, overall, it appears that teachers are effectively engaging with the worksheet prompts to think through how to incorporate wise feedback into their practice on an ongoing basis.

Step 5 – Ongoing Implementation Review

In the last step of the learning series, teachers completed a worksheet that asked them to review their ongoing efforts to implement wise feedback and then to complete a brief exit survey.

Review of Ongoing Efforts

Procedure. Teachers received a link to a worksheet, hosted on google forms, that guided them through several open-ended questions reviewing their ongoing implementation of wise feedback. The first question asked teachers to recap what they had done to implement wise feedback. It asked whom they had reached out to, how they did it, what they had said, and what if anything their students had said. Next, teachers were asked to assess whether they had explicitly explained the purpose behind their feedback and whether had they clearly communicated high standards and assurances. Then, teachers were asked to consider whether they had accomplished the goals they had designated for themselves in the prior step. Next, they were asked about their experience continuing to implement wise feedback, whether it felt authentic, and whether it helped them progress towards their goals for themselves as teachers. Finally, teachers were asked what advice they would give to other teachers about how to continue practicing wise feedback in their classroom. Lastly, teachers received a link to the exit survey which was hosted on Qualtrics.

Results. All 23 teachers who completed the planning ongoing practice worksheet in Step 4 completed the Step 5 review worksheet. Of the 23 teachers who completed the Step 5 worksheet, 18 self-reported having taken steps to reinforce wise feedback with their students. The 5 teachers who said they had not all said that this was because it was the end of the year and their students were either occupied with end-of-year activities or were already on summer break. As mentioned, the learning series may be best be delivered earlier in the school year.

Several interesting and encouraging responses emerged. One teacher described how she gave one of her students a wise feedback note that said, *"I'm giving you extra help because I have very high standards and know that you can meet them."* She noticed that the student had saved the note and put it inside his phone case. She went on to say that she had noticed his effort and performance had improved since she began utilizing wise feedback. Another teacher mentioned that she had already started teaching summer classes, but that she had a class discussion about feedback with her new class and that, based on her observations, this conversation had sparked increased engagement and interaction.

In response to the question asking teachers whether it felt authentic to them to use wise feedback, most teachers said explicitly it did. Many said that they were getting more comfortable implementing wise feedback and finding ways to communicate the purpose of their feedback including their high standards. Encouragingly, many teachers also emphasized the need for consistency in communicating wise feedback as well as flexibility in tailoring their feedback to different students' needs.

Spring 2023 Exit Survey and Overall Summary

Overall, the Spring 2023 pilot was highly successful. Below is a summary of key measures and findings from the exit survey.

Participants and Attrition rates. We set out with a goal of recruiting between 20 - 50 teachers. Thirty-six teachers completed the application to join the learning series and were invited and sent the materials. Of these, 27 teachers completed the first step of the learning series, the online wise feedback module. Of these, 23 completed all the required steps. Thus, 64% of teachers invited to participate in the learning series, and 85% of those who started it completed it. These figures should be understood in the context of a professional development program implemented outside of teachers' normal school and/or district-sanctioned professional development opportunities, and in compensation for a $200 Visa gift card.

Teachers' Evaluations. Overall, teachers in the Spring 2023 pilot overwhelmingly endorsed the learning series. When asked how they would rate their experience (*1 - Very Negative*, *5 – Very Positive*), 95% reported having a positive experience and 68% gave it the highest possible rating (*5*). When asked whether participating in the learning series had made their relationships with students better or worse, 86% said it had made their relationships at least "somewhat better"; none said it had made their relationships worse. When asked how much they thought that participating in the learning series would help them give better feedback to future students (*1 – Not at all*, *5 – Very much*), all teachers said it would help them and 70% said it would help them "Very much" (*5*) (26% said it would help them "A fair amount" and 4% said it would help them

"somewhat"). Finally, when asked how likely they would be to recommend the learning series to a friend or colleague (*1 – Not at all likely, 10 – Extremely likely*), 70% of teachers endorsed this recommendation at the very highest level (*10*; *range:* 7 – 10). See Table 6.

Table 6. Teachers' exit survey evaluations of the Wise Feedback Learning Series in the Spring 2023 Full Pilot.

Measure	Mean (SD)
Overall experience (1-5 scale)	4.64 (0.58)
Improved relationships with students (1 - 5 scale)	4.09 (0.61)
Helped them give better feedback to students (1-5 scale)	4.65 (0.57)
Likely to recommend to a friend or colleague (1-10 scale)	9.35 (1.11)

Teachers' open-ended responses corroborated their appreciation of and value for the learning series. Here is a sample of what teachers had to say when given a final opportunity to leave comments before submitting the exit survey:

"I'm grateful for the opportunity to learn about this. I feel like it was a little gem that landed in my lap right when I was in desperate need of something to push some of the kids without me having to cajole them (too much)."

"Thank you for putting this together! I felt it was a great use of my time and I learned a lot!"

"This was good professional development. Thanks for the opportunity to participate."

"I'm grateful!"

Changes in Teacher Confidence, Beliefs, and Practice. A second category of measures gauged change in teachers' beliefs and practices surrounding feedback.

Close-ended measures. We included three measures assessed at baseline (as a part of the application survey) and at the end of the learning series (in the exit survey). The first asked teachers to report how confident they were about giving students critical feedback in ways that keep them motivated and engaged (*1 – Not at all confident*, *5 – Very confident*). The second asked teachers whether they thought their students had a clear understanding that critical feedback can be a sign of respect and belief in their ability to reach a high standard (*1 – Definitely not*, 5 – Definitely yes). The third asked teachers how important they thought it was to clearly explain to students the reasons why you give them critical feedback (*1 – Not at all important*, 5 – Extremely important).

All three measures showed large and statistically significant change after teachers completed the learning series as compared to before. See Table 7.

Table 7. Change in teachers' beliefs and practices surrounding feedback before to after the Wise Feedback Learning Series in the Spring 2023 Full Pilot.

Measure	Before	After	Paired-Samples-t-test
Confidence in ability to give students critical feedback in ways that keep them motivated and engaged.	3.67 (0.91)	4.57 (0.51)	$t(20)=4.66$, $p<0.001$, $d=1.02$
Belief that their students clearly understand that critical feedback can be a sign of respect and belief in the student to reach a high standard.	3.43 (1.17)	4.52 (0.51)	$t(20)=4.81$, $p<0.001$, $d=1.05$
Perceived importance of clearly explaining to students why you give them critical feedback.	4.43 (0.60)	4.90 (0.20)	$t(20)=3.63$, $p=0.002$, $d=0.79$

Note. Means and SDs. All measures on 1-5 scales.

While these results are not experimental and thus cannot confirm causal effects, they suggest that completing the learning series increased teachers' confidence in their ability to deliver critical feedback using the themes of wise feedback in ways that motivate and engage students.

Open-Ended Reflections. The exit survey included several open-ended questions to allow teachers to reflect on their experience in the learning series as a whole.

First, teachers were asked how completing the learning series and implementing wise feedback had affected their relationships with students. Most teachers reported positive changes, as seen in Table 8A.

When asked what their biggest learnings from the learning series were, teachers largely reiterated the central message of the wise feedback module—the importance of explaining the "why" behind critical feedback and explicitly attributing feedback to their high standards and belief in students' ability to reach these standards. When asked what the biggest change in their practice was, a similar theme emerged: Teachers emphasized doing more to explicitly explain the purpose of critical feedback to their students. The reiterations of the main ideas underlying wise feedback provide strong evidence that teachers understood the concept and how to use it. Teachers not only appreciated the ideas behind wise feedback, but were eagerly implementing wise feedback in their classrooms.

A second set of open-ended questions asked teachers what aspects of the learning series they found most useful and what could be improved. Teachers had remarkably consistent responses to these questions. In general, they appreciated the organization of the learning series and found it manageable to complete at their own pace, as seen in Table 8B. As mentioned in one sample response, one suggestion for improvement was to start the learning series earlier in the school year. A second suggestion was to make teachers' own responses to surveys and worksheets more accessible to them to review later as reminders and refreshers. These recommendations are sensible, and we agree they would enhance the learning series.

An aspect of the learning series teachers particularly liked was the opportunity it provided for student input. Teachers consistently mentioned the student survey and classroom discussion as steps they found valuable. This endorsement reflects what we had observed in earlier pilots.

Finally, we asked teachers what they would say to other teachers considering participating in the learning series. Corroborating the quantitative evidence presented above, teachers consistently endorsed the learning series as a valuable professional development opportunity, as seen in Table 8C. The strong encouragement from teachers who have completed the learning series to peers may be the most encouraging evidence we have for the aptness and value of the learning series in practice.

Table 8. Sample open-ended exit-survey assessments of the Wise Feedback Learning Series from teachers in the Spring 2023 Full Pilot.

A. Effects on relationships with students
"I feel it created a more positive connection with my students. It forced me to be more intentional and give everyone attention, so I feel like kids who normally fall under the radar felt seen."
"It has built a more trusting relationship. It helped show me how communicative I have been this past year and helped me know which students I need to try harder to build a strong relationship with."
"My students were able to understand the purpose in me giving them feedback. They were more trusting and open to feedback during this process."
"I see an improvement in my relationship with my minority students; I have often felt that I was at a disadvantage with them as I am caucasian and am missing a connection. I am so happy to have had a tool to improve our relationship/help a student to pass my class/realize his abilities."
"I definitely saw a few students be more open to the feedback I was giving them, and engaging more in feedback conversations."
B. Aspects of the learning series that were most useful and what could be improved.
"I felt that this workshop was set up perfectly. It wasn't too overwhelming, it had simple steps, and each step could be applied right away. I wouldn't change anything, to be honest!"
"I appreciated this workshop. It was very manageable in terms of time commitments. It was very relevant and appropriate. Finally, I could immediately implement small changes based on the professional learning and the survey results."
"The material was very well organized. I like how self-paced the series was. It did seem very quick."
"I thought this was very useful and not overly burdensome. I have no feedback."

"I like all of the course work. I liked the google forms and how you planned for the next step."
"The timeline and suggested deadlines are great. Keep that up! I suggest not giving this at the end of a school year. I rushed to get this squeezed into the last few weeks before my students check out mentally! The assignments were short and easy to accomplish."
C. Would say to other teachers considering participating in the learning series.
"Totally worth it! Helps your thinking around the purpose of feedback and how to make it a successful process for you and the students!"
"This is a wonderful opportunity to make connections with students and help them understand that you believe they can do hard things!"
"Do it! This module allows you to reflect on how you are giving feedback and how it is impacting your students. Through five simple steps, you can make a change to your classroom community and how you give feedback to your students."
"If you're noticing that many of your students aren't responding to your feedback, this module has some helpful suggestions!"
"This module provides just-in-time feedback on feedback in the classroom. It is purposeful, goal-oriented, and relevant. It was time well spent."
"DO IT...IT IS NOT A SCAM. The workload was very manageable and with the short amount of time it took, I was able to takeaway a lot and applying it to my teachings."
"I would encourage the teacher to do it. I would say that it was helpful in improving the student-teacher relationship and would most-likely encourage the student to increase their efforts/learning/final grade (all are important)."

Spring 2023 Full Pilot Conclusions. Overall, we were very encouraged by the results of the Spring 2023 Pilot. This conclusion is based on teachers' fidelity in proceeding through the learning series; the quality of their participation at each step; and their endorsement of the learning series as a whole in the exit survey reviewed above.

The Spring 2023 Pilot provides a proof-of-concept demonstrating that the Stanford/Leading Educators Learning Series can be effectively implemented in a way that allows for autonomous and asynchronous completion. This greatly expands the potential scalability and reach of the program, both for the purpose of a well-powered impact evaluation and for the purpose of supporting more students and teachers. Building on the basic structure of the Spring 2023 Pilot toward such efforts, it will be helpful to refine the learning series and integrate tools that permit more automated delivery and implementation.

What aspects of the learning series could be improved in future implementations? First, as noted by many teachers, the learning series should be offered earlier in the school year. Several teachers commented that they ran out of time to complete all of the steps, or that they wished

they had had these materials at the beginning of the school year when they were establishing classroom expectations and norms. Indeed, social-psychological interventions are often most effective when delivered early in an experience or transition, as this is when patterns of interaction can be most malleable (Canning et al., 2018; Cook et al., 2012; Raudenbush, 1984; Walton & Cohen, 2011).

Second, we are eager to explore opportunities to increase the impact of the learning series by integrating it more coherently into existing school and district professional learning structures and, in turn, learning how teachers respond to it in this context. Would we see as positive responses among teachers who do not self-select into the program or who do not receive a $200 incentive, but who do complete it as part of a standard school or district professional development opportunity? It may also be helpful to explore additional strategies that could increase teachers' investment in the learning series. Would embedding the learning series into a peer learning structure increase investment? The feeling that one is working together with others to address a common problem can be a powerful source of intrinsic motivation (Carr & Walton, 2014; Howe et al., 2021). Could the learning series be offered in a way that promotes a sense of community around establishing school- or community-wide positive norms about feedback with students? Even as the autonomous and asynchronous nature of the program is maintained (to reduce coordination delays and facilitate scaling), simple revisions could represent these efforts in collective terms. For instance, teachers could be invited to participate in groups (e.g., all teachers in a given subject area at a given school) or placed in groups (e.g., by geographical region, grade taught, or subject area). Email communications could identify this group, provide relevant information about it, show other teachers' progress through the learning series, and showcase stories of growth and progress. In general, future implementations of the learning series should consider ways to foster a sense of community and feelings of working together among participants as well as between participants and designers, facilitators, and researchers.

Discussion

Thus far, the primary goal of this report has been to describe a professional development learning series we developed to improve teachers' feedback practices in the classroom. The Spring 2023 Full Pilot rollout provides promising evidence that the *Stanford/Leading Educators Wise Feedback Learning Series* can effectively improve teachers' confidence, beliefs, and practices surrounding delivering critical feedback. The next major step is to roll out the learning series more broadly and to systematically evaluate its causal impact on students' experience and academic achievement as well as teachers' professional experience through a large-scale teacher-level RCT.

A second major goal of this report is to briefly describe the iterative design process we have used to guide the ongoing development, evaluation, and refinement of the learning series. The success of the Spring 2023 Pilot directly reflects this process and the learnings from previous pilots, which date back to the Fall of 2018. We describe this history next.

A Brief History of the Iterative Design Process

Our iterative design process began with a partnership between the Stanford research team and the Advanced Placement (AP) Program at the College Board beginning in 2018. This partnership provided an opportunity to develop a single-session, large-scale online intervention for teachers. Across three rounds of pilot testing with this format, we developed and improved the *Wise Feedback Module*, which provides the foundation of the learning series. In each pilot, we looked to the previous pilot to guide revisions and refinements with the goal of developing a more impactful module. While this partnership provided an opportunity for large-scale deployment, it also presented constraints: We were only able to deliver content to teachers in a single online session and we were only able to access as outcomes teachers' responses to survey questions at the end of the module and students' end-of-year AP exam scores.

After these three rounds of pilots, we began the partnership with Leading Educators to develop the multi-step learning series featured in the Spring 2023 Full Pilot. This allowed us to provide ongoing support to teachers in implementing wise feedback with their students and greater access to teacher and student responses.

Next, we provide a high-level overview of this iterative process design, including what we learned at each stage and revisions made.

Phase 1: Initial Module Development and Testing in Partnership with The College Board and Equal Opportunity Schools (2018-2020). The first pilot was implemented as a randomized field-experiment with high school teachers who were part of the College Board's Advanced Placement program. Teachers were randomized to either a first version of the *Wise Feedback Module* or a control condition that included no wise-feedback content (teachers only answered questions). Of the 584 teachers who began the wise feedback module, 37% completed it. Among those who completed the module, over 75% reported that they had learned something meaningful. Additionally, compared to teachers randomized to the control condition, teachers who completed the wise feedback module reported a greater awareness of the roles that mistrust and worries caused by negative stereotypes play causing student disengagement in class(ds = 0.52 and 0.40, respectively [ps<0.001]). However, two critical limitations emerged. First, only 20% of teachers successfully generated feedback notes that met the three criteria for psychologically wise feedback (clear explanation of why feedback was delivered, statement of high standards, and assurance of belief in student ability). Second, we did not detect an overall impact of the module on students' end-of-year AP exam scores (although there were suggestive improvements in AP scores for students of color attending predominantly White schools, in subsample analyses).

In the next step in our iterative design process, we partnered with Equal Opportunity Schools, a nonprofit dedicated to reducing inequalities in upper-level high school classes. We gave the *Wise Feedback Module* to a small sample of teachers and conducted in-depth qualitative focus groups with 20-30 teachers in total. These discussions revealed a critical insight: Too often, teachers misinterpreted wise feedback as introduced in the original module as simply providing students encouragement (e.g., "I know you can do it!"). Yet this does not clarify *why* students are receiving critical feedback; as such, it allows negative attributions for critical feedback to persist (e.g., "Because you think this work is easy," "Because you think I'm dumb"). The critical

missing ingredient was the need to tell students explicitly why a teacher was giving them critical feedback—namely, because they held high standards and believed students could meet them.

Based on this learning, we revised the module to emphasize the importance of explaining *why* teachers give critical feedback, along with other improvements to clarity and engagement. A second field-experiment with AP teachers conducted during the 2019 – 2020 academic year tested these revisions. In addition, the recruitment strategy changed. Whereas the 2018-2019 Pilot was advertised only as a link on teachers' online AP dashboard and no compensation was offered for completing the module, in the 2019-2020 Pilot teachers were personally invited to participate by email and offered a $50 incentive for completing the module. Presumably as a consequence, completion rates rose from 37% to 78%. This increase in participation may mean that teachers were less narrowly self-selected than in the 2018-2019 Pilot.

Teachers' engagement with the module improved in the 2019-2020 Pilot. First, teacher endorsement strengthened dramatically: 92% reported learning something meaningful from the module (up from 75%) and 93% said they would recommend it to colleagues. We also saw improvements in teachers' feedback: 39% of teachers successfully produced notes that met the three wise feedback criteria, nearly doubling the 20% rate from the first pilot. Additionally, compared to the first pilot, teachers also showed stronger gains in the experimental tests of awareness of the roles mistrust and concerns about stereotypes play in causing student disengagement (ds= 0.64 and 0.59 as compared to the control condition, respectively [ps<0.001], up from ds=0.52 and 0.40). However, we again did not find significant effects on AP exam outcomes, though this may have been because AP testing was disrupted by COVID-19. Overall, while these improvements were encouraging, they also left room for improvement.

Phase 2: Transition to a Multi-Step Learning Series in Partnership with Leading Educators (2022 – 2025). The module-only pilots revealed that teachers appreciated the value of wise feedback and content of the module and that revisions across iterations improved teachers' responses. However, largely because of constraints arising from the limited contact points between teachers and the Advanced Placement program, we were unable to support teachers beyond the module or to see how teachers were using their learnings to implement wise feedback in their classrooms.

In the next phase of our iterative design process, drawing on our learnings from the first phase of pilots, we sought to enhance effectiveness and impact in two ways. First, we revised the opening of the module to affirm teachers' growth-oriented goals in providing students' critical feedback, including giving teachers space to articulate these goals for themselves, rather than jumping directly into how to provide feedback. Second and more fundamentally, we provided ongoing support through a series of structured follow-up exercises.

We designed and implemented these revisions in the Fall 2022 Pilot in partnership with Leading Educators, a nonprofit dedicated to developing teachers and promoting student success. This pilot tested our multi-step approach as a professional development learning series with four middle school teachers in the Chicago area over six weeks. The learning series combined the revised module (emphasizing the "why" of feedback) with five structured exercises: (1)

administering a student survey about feedback, (2) holding a class discussion to establish growth-oriented norms, (3) working individually with students, (4) conducting a second student survey about feedback, and (5) completing an exit evaluation. Weekly virtual meetings brought together the teachers and research team for collaboration, discussion, and planning.

Results exceeded expectations. All four teachers rated their experience as very positive (the highest possible rating). All said they would be extremely likely to recommend the learning series to colleagues (also the highest possible rating). Teachers' open-ended qualitative feedback was also overwhelmingly positive, as was their advice to another teacher considering joining the workshop, as seen in Table 9.

Table 9. Sample open-ended exit-survey responses to the Wise Feedback Learning Series from teachers in the Fall 2022 Pilot.

"THANK YOU for this opportunity and experience. Often teachers just dread having to go to meetings or PD because it doesn't seem like it will really work or be around for long. I found that I really looked forward to our Thursdays together and I also looked forward to implement what we learned and discussed in my classroom."
"I truly enjoyed the time in this series."
"I would and have told other teachers about this module… Any teacher I have shared this information with has been very grateful for the simple, direct method of providing students with our intentions, expectations, and assurance."

Importantly, we also obtained encouraging student-level data. In the second student survey, 72% of students (n = 152) reported that they liked the class discussion about feedback, 88% found the conversation helpful, 81% said it helped them understand their teacher's purpose for giving feedback better, and 89% reported that their teacher had gotten better at providing feedback. These results provide initial evidence that changes in teacher practice were noticed and appreciated by students. However, while this student survey provided valuable insight into the learning series, it did not function well as a learning tool for teachers, which was its original intent. Complicated patterns made the pre-post data difficult for teachers to interpret.

Overall, the Fall 2022 Pilot served as a proof-of-concept that the multi-step approach was feasible to implement and well-received by teachers. However, the weekly group meeting format was not feasible to scale. Thus, in the next iteration of the program, we redesigned the learning series to operate autonomously with asynchronous, self-paced participation while maintaining its core elements. To do so, we eliminated the weekly group meetings and replaced them with emailed instructions that allowed participating teachers to proceed through each step independently and at their own pace. We also dropped second student survey.

These changes led to the Spring 2023 Pilot described earlier. This pilot successfully demonstrated that the learning series could be effectively delivered in a scalable format that preserved its impact on teacher practice and student experience.

Summary of Iterative Improvements. Our iterative design process systematically addressed limitations identified in each pilot phase. From a stand-alone module with modest teacher uptake and limited practice translation, we developed a multistep learning series that maintains high teacher satisfaction while providing structured support for implementation. Figure 2 shows the improvements across successive iterations. Key steps included emphasizing the "why" of feedback delivery (from the 2018-2019 to the 2019-2020 Pilots), adding follow-up exercises to support ongoing implementations (from the 2019-2020 to Fall 2022 Pilots), and developing a scalable delivery format (from the Fall 2022 to Spring 2023 Pilots). Building directly on lessons learned from the previous phase produced a program that effectively bridges the gap between teacher understanding and classroom application.

Figure 2. Improvements in key learning and evaluative outcomes across three iterations of the *Wise Feedback Module.*
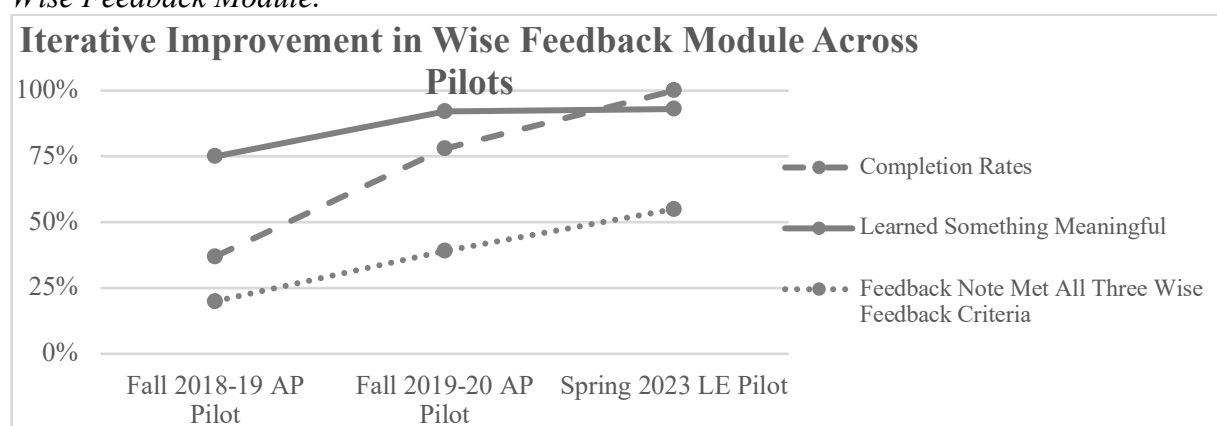
Note. Across the three pilots we saw substantial increases in the percentage of teachers who (1) completed the *Wise Feedback Module* if they began it, (2) reported learning something meaningful from the module, and (3) were able to successfully produce notes that met all three wise feedback criteria (i.e., the note explained *why* the teacher was providing feedback, attributed the feedback to their high standards, and assured students that they believed the student could meet those standards). AP=The Advanced Placement Program offered by The College Board. LE=Leading Educators.

Conclusion

Research often has a last-mile problem: even research that directly reveals practical solutions to applied problems often goes unused (Evans & Clarke, 2011; Paunesku et al., 2015). At the end of the day, in complex real-world settings, who will do what to capitalize on a known opportunity for positive change? And can this be done efficiently, with impact, at scale?

In this report, we have described a program that bridges critical communication divides between teachers and students. This program draws on insights that began with exceptional teachers; these insights were then honed and tested by researchers, beginning with small-scale laboratory studies and field trials (Cohen et al., 1999; Yeager et al., 2014). Using an iterative design process, we describe how we developed a program to return these insights to educators in a way that can reach a new generation efficiently at scale.

Future research will tell what impact this program can have for teachers and their students. However, we are optimistic (Hecht et al., 2023; Okonofua et al., 2022; Walton et al., 2023; Yeager et al., 2019; Yeager & Walton, 2011). It's not just that the problem of delivering high-

quality critical feedback is ubiquitous in education, across subject areas and grades. Feedback lies at the heart of both the opportunity students have to learn and the quality of teacher-student relationships—relationships that form the very foundation of schooling (Chhuon & Wallace, 2014; Kraft et al., 2023; Vygotsky, 1978; Walton et al., 2021; Yeager et al., 2017). Getting feedback right—being able to give and receive high-quality critical feedback on student work in ways that support learning and growth—may be the single most important task teachers and learners must accomplish together.

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Appendix: Sample Pages from the Stanford/Leading Educators Wise Feedback Module

Part 1: Why do students sometimes disengage from critical feedback?

One thing we've learned is that adolescents care **<u>a lot</u>** about what their teachers think of them—even if they don't always show it.

Students want to believe that their teacher sees them as having potential—as someone who can grow and succeed in school and beyond.

That means students pay close attention when they receive critical feedback on their work. It is a big part of how they understand what their teacher thinks of them. They want to think that their teacher has confidence in them, to know that their teacher believes they can grow with more work. *But when students receive critical feedback, they can wonder...*
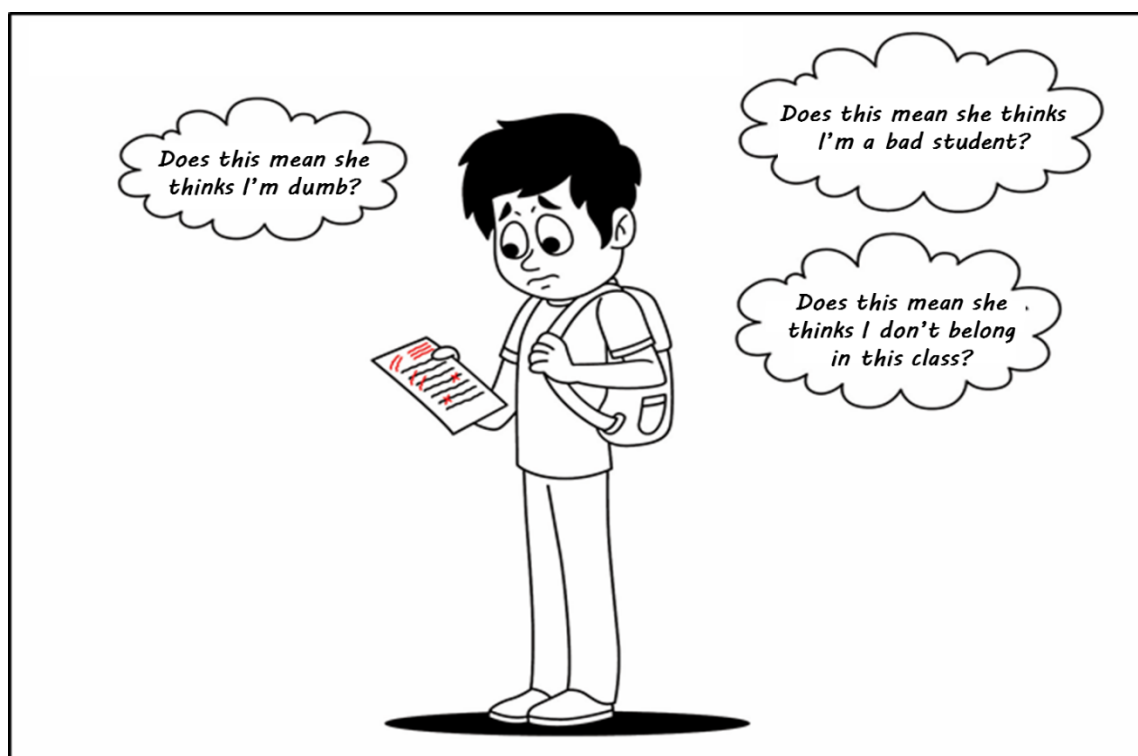
Some Students Come to School With Different Experiences–And Additional Worries

Some students have additional reasons to worry about how they could be seen in school. As children become teenagers, they become more aware of negative stereotypes about social groups they belong to.

- Girls might come to school having heard things like, "Girls aren't as good at math or science."
- Students of color, and students from lower income backgrounds, might have heard discouraging stories from family members and friends about how they were treated in school.

So it can be reasonable for these students to worry whether people in school, including teachers, might see them negatively. Even when teachers don't hold or express biases, just knowing that these stereotypes exist can lead students to feel extra stress and anxiety.

Then, critical feedback can be especially threatening. Students can wonder…
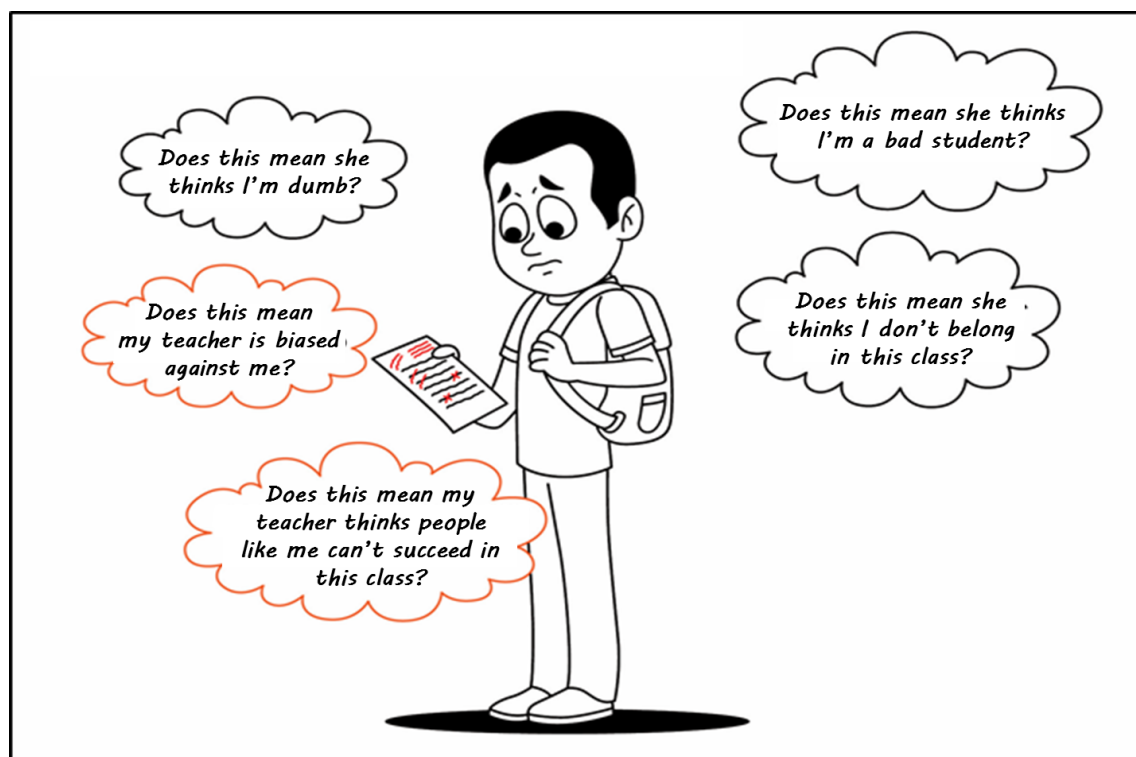
When these worries go unaddressed, they can fester and lead to mistrust. And that's a big reason why students sometimes disengage from feedback.

Part 2: How Can We Help Students?

It can be frustrating when you've stayed up late to give students high-quality feedback—only to find they disengage.

How can teachers give students feedback in ways that motivate them and help them learn and grow?

Tell Students *Why!*

What teachers tell us is that it helps to be explicit—**to tell students directly <u>why you are giving them critical feedback</u>—because you believe in their ability to reach a higher standard with feedback and further work.**
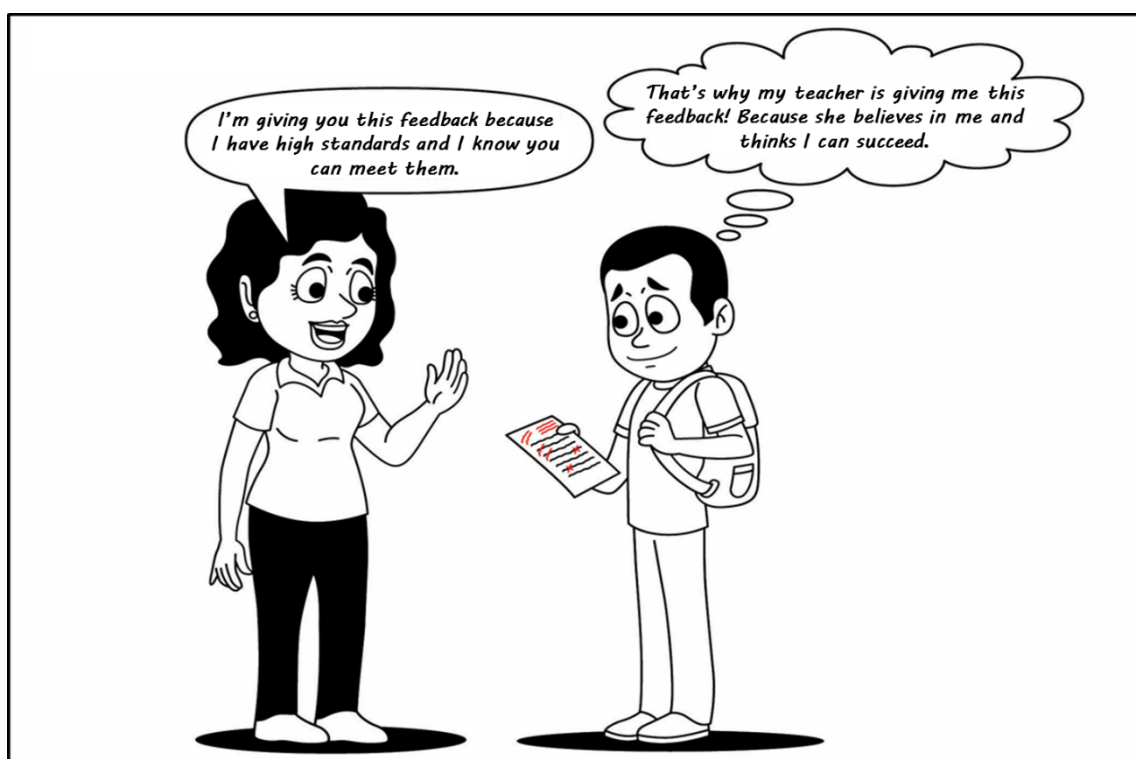
Being explicit shows students you believe in them. It removes any doubt about *why* you gave that student that feedback. That **can be groundbreaking**. For a student, there are few things more powerful than knowing that your teacher believes in you.

Summing It Up: The Ingredients of Wise Feedback

Overall, wise feedback means recognizing that there are two essential elements to critical feedback: (1) the content of the feedback itself and (2) what students think the purpose of the feedback is—why you are giving it and what it means about how you see them.

So there are two key ingredients:

The first ingredient is high-quality, personal feedback—feedback students can learn from.
- High quality feedback is among the most impactful practices teachers can use to promote student learning and achievement.
- Feedback is like **gold** for learning! All students can benefit from high-quality feedback.
- It's how you show your belief in and respect for your students.

Yet sometimes students don't know this…

That's why the second ingredient is to make sure your students understand the reason you work hard to give them high-quality feedback:
1. because you have high standards (aka "high standards")
2. because you believe in their ability to meet those standards with your feedback and more work (aka "assurance")

Telling students *why* you give them feedback helps them understand that feedback reflects your respect for them—and then they can use it well.

We can sum it up in a little equation.