TECHNICAL COMMUNICATION QUARTERLY, *20*(2), 139–166

ISSN: 1057-2252 print/1542-7625 online
DOI: 10.1080/10572252.2011.548762

Routledge
Taylor & Francis Group

"I Really Don't Know What He Meant by That": How Well Do Engineering Students Understand Teachers' Comments on Their Writing?

Summer Smith Taylor
Clemson University

Text-based interviews that compared the teacher's intention for a given comment on an engineering student's paper with the student's understanding of the comment were used to examine the extent to which students understand the comments they receive and to determine the characteristics of comments that are well understood and those that are not. The teachers' comments analyzed in this study were fully understood only about half the time. Inclusion of a reason or explicit instructions helped students understand the comments.

An engineering student reads a comment on his technical report and sighs. He says,

> I really don't know what he meant by that. I don't know if he really expected us to develop that program, or if he's saying that this solution is inappropriate because we can't develop that program and he wanted us to redo the whole thing, or what. Maybe just a better description of the programming that would be entailed would be enough, but I don't know.

Another engineering student reads a comment on his technical report and nods. He says,

> It helps me to know that when he was going through this he didn't think that heading stood out that much. Since I put a lot of effort into it—I worked on centering and everything—it kind of stood out to me when I went through it because I know where everything is. But having another reader point out that it's still not good enough lets me know that I should make it bigger next time.

In both cases, the students are thoughtfully considering the teachers' comments and attempting to derive lessons that they can apply to improve their writing. But the student in the first example is clearly frustrated by a lack of understanding of the teacher's comment, whereas the student in the second example appreciates the teacher's comment and easily converts that comment into a lesson for future application. As teachers, we hope our students understand and appreciate our comments and use those comments to improve their writing. But do they understand and appreciate our input? And what can we do to make our comments more effective?

Led by seminal studies such as Sommers (1982), Connors and Lunsford (1993), and Straub and Lunsford (1995), most research on response has focused on characterizing teachers' comments and suggesting best practices. Teachers have been encouraged to engage the student in a conversation through their comments (Anson, 1989), to anchor comments in the student's ideas and words (Sommers), to respond as a reader (Elbow, 1973), to include more praise (Gee, 1972), and to shake up the conventions of commenting to gain more attention from the student (Smith, 1997). In addition, Straub (2000) advised teachers to focus on content rather than form, to provide extensive explanation of evaluations, to avoid commands, to use minimal marking of errors, and to address only a small number of concerns in the comments on a given paper.

Studies on instructor commenting have generally focused on the response practices of writing faculty members, but some work has been done to characterize the commenting of engineering faculty members as well (Brinkman & van der Geest, 2003; Miller, Bausser, & Fentiman, 1998; Smith, 2003a, 2003b). Studies that compare engineering teachers' comments to established best practices in the field of composition have typically found that engineering faculty members fall short (Patton, 2003; Taylor, 2007; Taylor & Patton, 2006). Notably, evaluations of the quality of writing faculty members' comments have often returned a similarly negative result (Cohen, 1991; Maylath, 1998), although some studies have shown that writing faculty focus more on substance and provide more explanations than faculty in other disciplines (Patchan, Charney, & Schunn, 2009; Smith, 2003a, 2003b).

To determine whether the established best practices are actually best, we must examine the effect that teachers' comments have on student audiences. Such research on student reception of response is less common than are studies of the comments themselves. Investigators have tended to focus on two areas: (a) the types of comments students prefer and (b) the extent to which comments result in successful revisions or improved learning outcomes. Regarding preferences, Straub (1997) found that students prefer comments that state the reason for an evaluation and that tie the reason to the student's ideas or words, thus confirming an established best practice. On

the other hand, Ziv (1984) found that students' preferences sometimes conflict with established best practices. Specifically, she found that students disliked being offered options or being asked questions to encourage them to develop their own solutions to problems with their writing. Instead, students preferred to be told exactly how to solve a problem, a finding that raises concerns about appropriation and learning. Similarly, Patchan, Charney, and Schunn (2009) found that students' comments on peers' papers tended to offer more praise and directive solutions than did faculty comments, and Patchan, Charney, and Schunn speculate that the student practices reflect their preferences.

Studies that measure the extent to which comments lead students to revise or to achieve improved learning outcomes have attempted to address such concerns by examining the effectiveness of comments as teaching tools. The findings of such studies are often contradictory, however, and the studies tend to be localized and therefore have limited external validity. A substantial amount of the research has focused on the context of English-as-second-language (ESL) students. One study (Olson & Raffeld, 1987) of a psychology class indicated that readerly comments helped students revise their writing and learn course content. However, in an ESL context, readerly comments tended to be ignored, perhaps because students felt that their texts were clear, even though the readers expressed a lack of understanding (Chapin & Terdal, 1990; Ferris, 1997). Comments indicating that students needed to elaborate their ideas tended to lead to revisions in both contexts, although the revisions varied in quality. In a study of students in design studio classes, comments that coached students to think through a problem on their own seemed to help students professionalize (Dannels & Martin, 2008), but Ferris and Roberts (2001) found that comments intended to engage ESL students in problem solving about mechanics errors had no better impact on revision than did more directive comments. O'Neill and Fife's (1999) reminder is well taken: Students' preferences and the importance they attach to comments are affected by contextual factors including the classroom experience, the teacher's ethos, and previous teachers' comments. The variation in results of revision studies suggests that students' own characteristics as learners also have an important effect. In addition, Dannels and Martin have called for more discipline-specific research on response and its effects on students' learning because the disciplinary element of context has received little attention.

One common implication of studies of revision is that students have trouble understanding teachers' comments. But since Sperling and Freedman's (1987) case study of one composition student, few researchers have directly studied the extent to which students understand teachers' comments. A few small-sample interview studies of ESL students (Chapin & Terdal, 1990; Ziv,

1984) have confirmed that these students sometimes have difficulty understanding teachers' comments, particularly if the comments lack examples (Ferris, 1995) or use mitigations such as hedges, questions, and readerly responses (Hyland & Hyland, 2001).

Researchers have not systematically investigated the extent to which students understand their teachers' comments. This missing link is necessary to connect what we know about teacher response practices with what we are discovering about comments' effects on students' learning and to address the problems that we see with how students use those comments. We cannot assume that students understand all types of comments equally, but we should not assume that a lack of understanding is the sole explanation for misuse of our advice either. Thus, in this study, text-based interviews that compare the teacher's intention for a given comment with the student's understanding of the comment were used to address the following questions:

1. How well do students understand the comments they receive?
2. What characterizes comments that are and are not well understood, and how well do these characteristics match the established best practices of response?
3. What are students' views on the helpfulness of various types of comments?

Because context has a strong effect on both the writing and the reading of comments, this study focused on a particular context: engineering writing. Disciplinary commenting is receiving more attention but is still a neglected area. This study examined the comments of both engineering and technical writing teachers because engineering students learn about writing from both sources. Thus, it addressed a fourth research question: Do differences exist between the extent to which students understand engineering and writing teachers' comments?

METHODS

To enable comparison of the teacher's intention with the student's understanding, I interviewed teachers and students about the comments on the students' papers. Ten teachers participated—five from engineering and five from technical writing classes—and all human subjects regulations were followed. The five engineering teachers represented five departments selected to represent a range of disciplines: chemical, civil, general, industrial, and mechanical engineering. Each professor was teaching a class that required technical report writing. Three of these classes were at the senior level, one was at the sophomore level, and one was at the first-year level. Two

of the teachers were full professors, one was an associate professor, one was an assistant professor, and one was a graduate assistant who graded papers for a tenure-track professor.

The five technical writing teachers were selected randomly from all technical writing teachers in the year of the study. All were non-tenure-track instructors in the English department. Three were in their first year of teaching technical writing, one had been teaching for 2 years, and one had been teaching for 5 years. They typically taught 4 to 10 technical writing classes each year. The technical writing classes enroll juniors and seniors in engineering and other technical and scientific fields and are required of most engineering students.

I selected three papers per teacher by selecting three students at random from each class roll. (In the technical writing classes, the random selection was made from a list of only the engineering students.) Only one student declined to participate, and in this case, another student was selected at random from that class. Some of the papers were collaboratively written, so a total of 49 students participated in the study. The students represented eight engineering majors: 1 bioengineering, 1 ceramics and materials, 9 chemical, 16 civil, 1 computer, 4 electrical, 12 industrial, and 5 mechanical. Twenty-seven of the students were seniors, 8 were juniors, 11 were sophomores, and 3 were first-year students.

The papers studied were the first substantial papers assigned in each class, so the students had not yet developed familiarity with the teachers' commenting styles. In three of the technical writing classes, the first assignment was a set of instructions; in all other classes, the first assignment was a report. The average grade of the papers in the engineering classes was B−, with the grades ranging from A+ to F. The average grade of the papers in the writing classes was A−, extending from A+ to C. The average length of the engineering papers was 12 pages, and the average length of the writing papers was 7 pages. Engineering faculty members wrote an average of 25 comments per paper, and writing faculty members wrote an average of 22. In all, the study included 708 comments.

Within days of the return of the graded papers, I interviewed the teacher and the students. I asked each teacher to explain what he or she meant in each comment on the three selected papers from his or her class. The teacher interviews lasted between 60 and 90 minutes. I asked each student to explain what he or she thought the teacher meant in each comment on his or her paper. In addition, the student was asked to note comments that were particularly helpful or unhelpful and to explain why. The student interviews typically lasted between 20 and 30 minutes.

I coded both the teacher and the student statements about each comment for focus (such as organization, mechanics, etc.), using a slightly

modified version of the categories established in Smith (2003a). (See the appendix for definitions of the focus categories.) This coding was designed to determine whether the student recognized the focus that the teacher had intended to convey. As a check on the coding, I enlisted a second rater to code a randomly selected 100 comments (14% of the total sample). The agreement with the original coding of focus (both teacher and student focus) was 90%. In addition, several of the teachers and students who participated in the study were asked to review a portion of the coding of their comments and perceptions. They did not identify any significant discrepancies.

Next, I coded the student statements for understanding of the teacher's reason for writing the comments—the extent to which students understood which aspect of their papers triggered each comment. The teacher's explanation of the reason for the comment (elicited in the teacher's interview) was compared with the student's explanation of the reason for the comment (elicited in the student's interview). Each student statement was marked yes, no, or partial to indicate the student's level of understanding of the teacher's reason. If the student's explanation for the reason for the comment closely matched the teacher's, the statement was marked yes. If the student's explanation did not resemble the teacher's explanation at all, the statement was marked no. In many of these cases, the students failed to recognize the focus of the comment, making understanding of the reason especially difficult. But students did at times recognize the focus of a comment without understanding the reason behind it. For example, one teacher explained the reason for a comment about developing ideas as "They don't tell me what the solutions are." The student recognized the comment as focusing on development of ideas but understood the reason as "We should leave off our criteria." Other statements were coded as no because the student was unable to guess a reason for the comment. Statements coded as partial reflected that the student understood some but not all of the teacher's meaning. A second rater agreed 92% with the original coding of understanding of reason.

Finally, I coded the written comments for mode and phrasing. Following the methods of Straub and Lunsford (1995) and Taylor and Patton (2006), I coded the comments as authoritative evaluations (further coded as positive or negative), readerly, or coaching. Authoritative comments are evaluative and usually directive. They might be positive or negative, but these comments most often give the student advice about how to improve an aspect of the report. They might simply offer an evaluation, such as "good job." Readerly comments express the teacher's experience as a reader of the report. They might indicate confusion or appreciation, but these comments speak directly about the process of reading and understanding. Coaching

comments prompt the student to think further about a topic. These comments are often stated as questions.

I also added two categories of mode: "in-line edit" and "mark only." These categories identified comments that included no explanatory material and therefore could not be cleanly categorized into one of the traditional three modes. In-line edits are revisions of the student's writing without additional explanation. Mark-only comments included no words but only one or more marks, such as a check, an X, a circle, a line (strikethrough or underline), an arrow, or a question mark. A second rater agreed 94% with the original coding of mode.

Comments were also marked if they used phrasing that was found or presumed to be significant in previous research on commenting. Specifically, comments with the following phrasings were marked: fragment, question, and command. Fragments are incomplete sentences (often simply phrases), questions are interrogatories, and commands are sentences in which the subject is an implied "you." In cases in which a comment included more than one sentence or sentence fragment, only the first one was checked for these phrasing types. Agreement of the second rater with the original coding of phrasing was 98%.

RESULTS

The results address the variety of comments that the teachers made on students' papers as well as the students' understanding of the focus of and reason for the comments.

Repertoire of Comments

Examination of the comment focuses intended by the teachers establishes the repertoire of comments used by the 10 engineering and writing teachers in this study (see Table 1).

Comments on development of ideas were most common for engineering teachers (27%) and writing teachers (24%), consistent with Smith's (2003a) findings. Also consistent with Smith's findings, the engineering teachers emphasized content (61%) more than form (38%). In contrast with the Smith (2003a) results, the writing teachers in this sample emphasized form (50%) more than content (36%).

Mechanics was the second most common focus for both groups of teachers (14% of engineering teachers' comments and 19% of writing teachers' comments), followed by design (11% of engineering teachers' comments, 18% of writing teachers' comments). However, engineering teachers

TABLE 1
Repertoire of Comments of Engineering and Writing Teachers

	Comments by Engineering Teachers		*Comments by Writing Teachers*		*All Comments*	
Comment Focus	#	*ave %**	#	*ave %**	#	*ave %**
Content Evaluations						
Development	110	27	80	24	190	25
Validity	21	4	1	0	22	2
Coherence	9	2	1	0	10	1
Organization	12	4	12	4	24	4
Rhetorical effectiveness	1	0	14	4	15	2
Technical approach	66	14	0	0	66	7
Completeness	26	10	14	4	40	7
Content evaluation total	245	61%	122	36%	367	48%
Form Evaluations						
Mechanics	49	14	84	19	133	16
Style	30	8	44	10	74	9
Word choice	14	4	7	1	21	3
Design	30	11	46	18	76	15
Form evaluation total	123	38%	181	50%	304	44%
Holistic Evaluations						
Holistic	10	2	25	13	35	7
Effort	0	0	2	1	2	1
Holistic evaluation total	10	2%	27	14%	37	8%
Total comments	378		330		708	

*The average percentage is the average of the percentage of comments in the category written by each teacher.

wrote technical-approach comments as often as mechanics comments (14%), whereas writing teachers never wrote technical-approach comments. The lesser, but still important, emphases of the two groups of teachers were divergent. For engineering, the fourth most common focus was completeness (10%), whereas holistic comments (13%) and style (10%) were next for writing teachers. The apparently large number of holistic comments by writing teachers is somewhat misleading, however, because a majority of these comments were written by one teacher.

Students were quite accurate in their perceptions of the number of each type of comment written by writing and engineering teachers (see Table 2). It should be noted that this accuracy is not the same as correctly interpreting each comment but rather shows that the students tended to accurately perceive emphasis within the commenting repertoire. Students tended to see fewer validity and technical-approach comments and slightly more mechanics comments than were actually present on their papers.

TABLE 2
Student Perceptions of Commenting Repertoire

	Comments by Engineering Teachers		*Comments by Writing Teachers*		*All Comments*	
Student's Guess About Focus	#	%	#	%	#	%
Content Evaluations						
Development	97	26	70	21	167	24
Validity	13	3	1	0	14	2
Coherence	6	2	0	0	6	1
Organization	16	4	12	4	28	4
Rhetorical effectiveness	2	1	11	3	13	2
Technical approach	47	12	0	0	47	7
Completeness	26	7	15	5	41	6
Content evaluation total	207	55%	109	33%	316	46%
Form Evaluations						
Mechanics	58	15%	75	23%	133	19%
Style	22	6%	46	14%	68	10%
Word choice	16	4%	12	4%	28	4%
Design	26	7%	47	14%	73	10%
Form evaluation total	122	32%	180	55%	302	43%
Holistic Evaluations						
Holistic	8	2	21	6	29	4
Effort	0	0	1	0	1	0
Holistic evaluation total	8	2%	22	6%	30	4%
Not able to guess	41	11	19	6	60	8
Total*	378		330		708	

*Total includes sum of content focus, form focus, holistic, effort, and not able to guess.

Students' Understanding of Comments

This study identified two components of students' understanding of comments: recognition of the focus of the comment and comprehension of the reason for the comment. Comments were referred to as "recognized" if the student identified the focus intended by the teacher and as "well understood" if the student identified both the focus and the reason for the comment.

Recognition of focus. Examination of the students' recognition of the focus of the comments produced fairly good news. Students were 74% accurate in identifying focus (see Table 3). Students incorrectly guessed a focus 18% of the time, with the most common incorrect guesses being development of ideas or one of the form focuses. These were reasonable guesses because development of ideas and form-focused comments were the most

TABLE 3
Student Recognition of Comment Focus

	Student Recognized Teacher's Focus		*Student Guessed Teacher's Focus Incorrectly*		*Student Unable to Guess*	
Teacher's Focus	#	%	#	%	#	%
Content Evaluations						
Development	143	75	31	16	16	8
Validity	10	45	8	36	4	18
Coherence	4	40	5	50	1	10
Organization	18	75	4	17	2	8
Rhetorical effectiveness	9	60	3	20	3	20
Technical approach	38	58	21	32	7	11
Completeness	30	75	5	13	5	13
Form Evaluations						
Mechanics	119	89	10	8	4	3
Style	50	68	17	23	7	9
Word choice	15	71	5	24	1	5
Design	63	83	5	7	8	11
Holistic Evaluations						
Holistic	25	71	8	23	2	6
Effort	0	0	2	100	0	0
Total	524	74%	124	18%	60	8%

common comment types. Of course, concluding that a comment was a common type caused students to overlook some of the less common focuses, suggesting that these comments need more elaboration. Unfortunately, the students were unable to venture any guess about the focus of 8% of the comments, and in fact, this "I have no idea" response was the most common response if the student did not recognize the focus correctly.

In general, form-focused comments proved easier to recognize than did content comments. Of form comments, 81% were recognized, compared with 69% of content comments. Students were unable to guess any focus for 7% of form comments, compared with 10% of content comments. However, students were nearly as likely to recognize content comments as focused on content (81%) as they were to recognize form comments as focused on form (88%). In other words, the comments enabled students to differentiate content focuses from form focuses, but students were less able to differentiate between types of content focuses than between types of form focuses.

The most likely comments to be recognized were mechanics comments, which were recognized 89% of the time. Half these comments were in-line edits, such as corrections of misspellings and additions of commas. The comments least likely to cause students to refuse to venture any guess about

their focus were mechanics (3%) and word choice (5%). Form-focused comments tended to be interpreted as mechanics if they were not recognized accurately, perhaps because mechanics was the most common type of form comment (though only by a slight margin of 1% over design) and perhaps because the students tended to view teachers' comments as rule-based. Form-focused comments that were not recognized were guessed as mechanics 23% of the time.

The comments least likely to be recognized were coherence (40%), validity (45%), and effort (0%, but the sample included only two such comments). These were three of the four least common focuses, so students were less accustomed to seeing and recognizing them. Coherence comments tended to be confused with development of ideas; 83% of the unrecognized coherence comments were interpreted as development. This finding suggests that students had difficulty recognizing the difference between level of detail (development) and relevance or internal consistency of details (coherence). For example, one engineering teacher wrote, "Why? Didn't you already do this to get your performance ratings?" and explained to me, "It makes no sense and if you finish up your paper with something that is completely inconsistent with the rest of the paper, it affects the coherence of the entire document." The student, on the other hand, thought the comment related to development of ideas, saying, "We should have elaborated and explained more."

Unrecognized validity comments were dismissed as unguessable 18% of the time. Other guesses ranged from organization to style to word choice. Students seemed to resist recognizing that their information was actually wrong. Instead, they tended to think that the teacher was indicating that the information was merely misplaced or misstated. For example, one engineering teacher explained his marginal comment of "set points" as

> a correction because they said the computer was used to set different steam pressures. You're not actually setting the steam pressure. You're telling the computer what you want the steam pressure to be, and then it's up to the computer to make it that. What you actually vary is the steam pressure set point, which is where you want the steam pressure to be.

The student misinterpreted this validity comment as a style comment, saying,

> Well, I think that is just a difference in the way we're writing. Because I think it's clear from the sentence that these were just set points. But he didn't think it was clear, so he wrote set points out there.

This tendency of students not to recognize validity comments suggests that teachers should more clearly highlight the topic of validity comments as the

truth of the information and perhaps elaborate more fully on the concept that the student needs to learn. Comments that included phrases such as ''can't be right'' or ''not so!'' were recognized by students as validity comments, giving the students a better opportunity to identify mistakes and learn from them.

Technical approach and rhetorical effectiveness comments, also relatively rare in the sample, were also recognized less than two thirds of the time. Rhetorical effectiveness and validity comments were the most likely to be deemed unguessable by the students (18% of all validity comments and 20% of all rhetorical effectiveness comments). For example, a writing teacher wrote ''good analogy'' and explained that this comment focused on the rhetorical effectiveness of the student's writing: ''I said it is good because I encourage them to try to make the unfamiliar familiar to their audience, who are professional lay readers. We talked a lot about that in class.'' The student, however, could not guess the focus or reason for this comment. He said, ''I guess the analogy was okay. That comment was kind of confusing and I guess I should go talk with him about it.'' Rhetorical effectiveness comments were written almost exclusively by writing teachers, whereas technical-approach and validity comments were written almost exclusively by engineering teachers. These focuses represent the core content of the engineering and writing classes. The lack of recognition of these comments and the fact that they were so frequently dismissed as unguessable suggest a serious problem with the use of comments to teach course content. Students seemed to view comments as focused almost entirely on their ability to select, organize, and express ideas acontextually, rather than their ability to perform technical work or accommodate an audience.

Development of ideas comments deserve special attention because they represented the most common comment focus. Perhaps due to the prevalence of development comments, content-focused comments that were not recognized were most likely to be interpreted as development comments (17% of incorrect guesses about nondevelopment content-focused comments). Students recognized development comments 75% of the time, an average amount. They rarely dismissed development comments as unguessable, but incorrect guesses ranged across all categories fairly evenly, including across form categories. This finding suggests that students find unrecognized development comments especially confusing.

Comprehension of reason for the comment. The results of the examination of students' comprehension of the reason for the teachers' comments are not encouraging. Only 55% (388) of the 708 comments in the study were well understood, with both focus and reason recognized. (See Table 4, which shows the extent of understanding of the reason behind comments in each

TABLE 4
Effect of Focus on Student Understanding of the Reasons for Comments

	Well Understood		*Not Understood*		*Partially Understood*	
Teacher's Focus	#	%	#	%	#	%
Content Evaluations						
Development	108	57	53	28	29	15
Validity	11	50	11	50	0	0
Coherence	5	50	5	50	0	0
Organization	11	46	11	46	2	8
Rhetorical effectiveness	8	53	4	27	3	20
Technical approach	32	48	22	33	12	18
Completeness	25	63	12	30	3	8
Form Evaluations						
Mechanics	87	65	31	23	15	11
Style	26	35	38	51	10	14
Word choice	11	52	8	38	2	10
Design	45	59	26	34	5	7
Holistic Evaluations						
Holistic	19	54	7	20	9	26
Effort	0	0	0	0	2	100
Total	388	55%	227	32%	93	13%

focus category.) If we include comments for which the student partially understood the reason, the percentage increases to only 68% (481) of the 708 comments in the sample. Given that comprehending the reason for the comment is more important than simply recognizing the focus of the comment, it is problematic that students fully grasped the reason only approximately half the time. When students do not grasp the reason but only recognize the focus of the comment, any attempt to learn from or to apply the comment is, at best, an exercise in rule following (whether or not the comment was intended to represent a rule).

Even if their focus was recognized, some comments were less likely than others to be well understood. Approximately half the validity, organization, style, and word-choice comments were not well understood, even when their focuses were recognized. More often than with other focuses, the problem appeared to be a disagreement between the teacher and the student. The student guessed a reason (which may or may not have been correct) but disagreed with that reason. Therefore, students discounted the comment in the same way they would have if they had not understood the reason at all. For example, one student reacted to a style comment in this way: "I used 'consequently' and he is suggesting I use 'however' and maybe he thinks it's clearer. But I really don't see why it makes a difference so I'll just move on."

In general, comments in the form-focused categories were not well understood, even though the focus of form comments was more likely to be recognized. Style comments had a particularly low rate of full understanding (35%). This finding suggests that students could identify the focus of form comments but did not understand or perhaps care about the reason for the comment. ''That's one of those comma rules,'' one student said, adding, ''I get that marked a lot.'' The students seemed to view the form comments as primarily rule based and therefore assumed the reasons for the comments were ''just rules'' that they did not necessary know or would not necessarily remember if they took the time to study them.

Differences in interpretation of comments by engineering and writing teachers. The most substantial differences between accuracy of recognizing the focus of engineering and writing teachers' comments were in the form-focused categories. Students were considerably more likely to recognize style and design comments written by writing teachers. These comments were recognized 80% (35/44) and 89% (41/46) of the time, respectively, whereas they were recognized only 50% (15/30) and 73% (22/30) of the time, respectively, when written by engineering teachers. Students were also much more likely to recognize word choice comments that were written by engineering teachers (79%, 11/14) than by writing teachers (57%, 4/7). The reasons for these differences will be explored further in the discussion of comment characteristics.

Students were almost twice as likely to dismiss an engineering teacher's comment as unguessable (11%, 42/377) than a writing teacher's comment (6%, 19/337). Students had a particularly high degree of uncertainty when they did not recognize style and validity comments written by engineering teachers; they found the focus unguessable 40% of the time (6/15 and 4/10, respectively). Because style comments were also only recognized 50% (15/30) of the time, they seem particularly problematic in engineering commenting. But other focuses were also frequently unguessable when written by engineering teachers: completeness (15%, 4/26), development (11%, 12/110), and technical approach (11%, 7/66). Writing teachers were not immune to this problem, but only two focuses were more frequently than usual unguessable in their comments: rhetorical effectiveness (21%, 3/14) and organization (17%, 2/12). For both groups of teachers, more work seems to be needed in teaching these focuses so that students will recognize comments about them.

Students were somewhat more likely to recognize comments about development of ideas when the comments were written by a writing teacher (81%, 65/80) than by an engineering teacher (71%, 78/110), even though writing teachers wrote development comments less frequently.

The proportion of well-understood comments was nearly the same for engineering teachers (55%, 208/378) and writing teachers (54%, 178/330). However, students were much more likely to partially understand writing teachers' comments (19%, 63/330, compared with 8%, 30/378, of engineering comments). If these partially understood comments are included with the well-understood comments, 37% (140/378) of engineering teachers' comments, compared with 27% (89/330) of writing teachers' comments, remain as those for which the reason was not at all understood. Students' lack of recognition of technical-approach comments seems to have played an important role in this difference. Forty percent of partially understood engineering comments were technical approach comments, but students recognized only a quarter of these as technical approach comments, so they were coded as not fully understood. The students tended to think that the teacher wanted more detail (development) when the teacher was actually questioning the student's approach to a technical issue.

Characteristics of Comments

What characterizes the comments that are—and are not—well understood? How well do these characteristics match the established best practices of response? Some of our findings confirmed our expectations, but others were surprisingly counter to established best practices.

Characteristics of recognized and unrecognized comments. Not surprisingly, one of the types of comment that was least likely to be recognized was the mark-only comment (in which a teacher simply circles or underlines a word or phrase, or writes a check or X, without further explanation). (See Tables 5 and 6 for data on the effect of mode and phrasing on recognition of

TABLE 5
Effect of Mode on Student Recognition of Comments

	Focus Recognized		*Focus Not Recognized*	
*Comment's Mode**	#	%	#	%
Negative evaluation	247	77	72	23
Positive evaluation	44	62	27	38
Readerly	33	70	14	30
Coaching	12	71	2	29
In-line edit	116	79	30	21
Mark only	62	64	35	36

*Summary or end comments were not categorized for mode because they included multiple modes.

TABLE 6
Effect of Phrasing on Student Recognition of Comments

	Focus Recognized		*Not Recognized*	
*Comment's Phrasing**	#	%	#	%
Command	55	85	10	15
Fragment	81	74	28	26
Question	73	72	29	28

*This table includes only the comments that were phrased as commands, fragments, or questions. The other comments in the sample were declarative sentences, in-line edits, or mark-only comments.

focus.) The teacher's intended focus of mark-only comments was recognized only 64% of the time. However, surprisingly, the least recognized type of comment was the positive evaluation (62% recognized), which we would expect students to attend to and which we hope will motivate them to continue to practice particular skills that they displayed in their writing. In fact, both of these comment types—mark-only and positive evaluation comments—were advocated by Straub (2000) and others, but they were not recognized by students even as often as the average comment, so the comments' effect must be less than hoped. Positive comments such as "nice heading" (which produced the student response "I guess it's good, but I don't know why") were too vague to be understood, and more detailed positive comments were often dismissed because, as one student put it, they are "just something nice you say before you give a critique."

The comments most likely to be recognized were commands (recognized 85% of the time), a directive style that best practices typically encourage teachers to avoid in favor of questions. Questions were recognized at about the same rate as most comments (72%). The better recognition achieved by commands may be due to the fact that 75% of commands are, in Ziv's (1984) terms, "explicit." That is, the commands state exactly how the teacher thinks the student should revise his or her text, but they stop short of in-line editing. For example, when commenting on a graph, one engineering teacher wrote "change the axes to show the region of interest larger." Such comments tend to be preferred by students (Ziv) and might therefore receive more attention and comprehension than other comments. But studies of assessment (Sommers, 1982; Straub, 2000) warn that commands exert too much control over the student's text. The mode likely persists partly because teachers might find comments easier and more intuitive to write explicitly as commands ("Split this into constraints and criteria") than as questions ("Can you split this into constraints and criteria?"). And the question form

hardly disguises the control being exerted by the teacher. In fact, teachers might have difficulty writing explicit comments that do not appropriate the student's text, so teachers might be forced to trade off one benefit for another. Therefore, teachers could strive to change some commands to suggestion statements (''The argument would be clearer if you split this into constraints and criteria.''), which tend to have the added benefit that they include an explanation of the suggested change, a feature that is also preferred by students and assessment scholars.

Other types of comments that were slightly more likely than average to be recognized were negative evaluations (recognized 77% of the time) and edits (79%). Fragments, another comment type that does not make the list of best practices, were recognized an average amount (74%). In general, then, the more authoritative, directive comments were better recognized than were the more thought-provoking or encouraging comments.

Characteristics associated with comprehension of the reason for a comment. The picture becomes even more complicated when we examine the characteristics associated with well-understood, not simply recognized, comments. For an overview of the effect of mode and phrasing on students' understanding of the reason for a comment, see Tables 7 and 8.

In general, readerly, coaching, question, and command comments tended to produce better understanding than did negative evaluations and edits, with positive evaluations, mark-only, and fragment comments lagging behind. Note that the phrasings represented in Table 8 can appear in various modes. An evaluative comment could be stated as a command, as a fragment, or even as a question. Coaching comments are often questions but could reflect other phrasing. As a result, in this discussion, mode and phrasing have been separated for analysis.

TABLE 7
Effect of Mode on Student Understanding of the Reasons for Comments

	Well Understood		*Not Understood*		*Partially Understood*	
*Comment's Mode**	#	%	#	%	#	%
Negative evaluation	173	54	102	32	44	14
Positive evaluation	31	44	22	31	18	25
Readerly	30	64	13	28	4	9
Coaching	10	59	6	35	1	6
In-line edit	82	56	46	32	18	12
Mark only	48	49	39	40	10	10

*Summary or end comments were not categorized for mode because they included multiple modes.

TABLE 8
Effect of Phrasing on Student Understanding of the Reasons for Comments

	Well Understood		*Not Understood*		*Partially Understood*	
*Comments Phrasing**	#	%	#	%	#	%
Command	39	60	19	29	7	11
Fragment	44	40	45	41	20	18
Question	63	62	26	25	13	13

*This table includes only the comments that were phrased as commands, fragments, or questions. The other comments in the sample were declarative sentences, in-line edits, or mark-only comments.

However, examination of the data indicates that the effect of mode and phrasing on understanding differed from one focus to another. As a result, study of the effects on a focus-by-focus basis might be more helpful than is a study of the complete data set. But it is important to note that we have data only on the types of comments that were written. If no question comments were written in some categories, for example, we cannot know how well questions work in those categories. Such is the drawback of studying authentic comments. So to elucidate the effects of comment characteristics on understanding the reason behind comments, let us examine two different types of comments for which we have larger numbers of comments in the sample: development and mechanics comments.

Some characteristics that were associated with well-understood comments in these two focuses are traditionally favored, best-practice characteristics. For example, 72% (23/32) of readerly and 67% (42/63) of coaching and question comments about development of ideas were well understood, compared with 56% (107/190) of development comments overall. (Note that this section reports values not listed in separate tables, due to the small data set.) These characteristics were present in small numbers in the mechanics comments, but 100% (3/3) of the readerly, coaching, and question comments written about mechanics were well understood. In addition, mark-only comments about mechanics were well understood 86% (19/22) of the time. Some discussions of best practices (such as Straub, 2000) advocate minimal marking of mechanics errors, and this strategy seemed to produce understanding. Also confirming best practices, only 18% (3/17) of mark-only comments about development were well understood. These comments are typically simply a check mark or X, a poor means of expressing a meaning about students' ideas.

Some characteristics associated with well-understood development and mechanics comments, however, are not established best practices. For

example, 80% (8/10) of edits in development comments were well understood, making edits the characteristic most closely associated with understanding of these comments. However, best practices do not advise teachers to use in-line editing to make comments about the development of students' ideas, due to concerns about control as well as the difficulty of capturing complex content-focused advice in an edit. But for the students in this sample, edits worked well to convey not only the focus but the reason behind comments about development. For example, one teacher added "including alternatives such as . . ." to a student's sentence, causing the student to say "Yeah, I thought about those and it would have been good to include them." Perhaps simply seeing a rewording of or addition to their text helped students to understand the reasons for and the complexities of the suggested changes.

Edits related to mechanics, a more expected comment type, were well understood about as often as the overall rate of understanding of the entire comment sample (68%, 45/66), even though these comments are not advocated by best practices due to the control they assert over the student's text. Also, 67% (2/3) of commands about mechanics were well understood. The commands tended to provide explicit information about how to revise (such as "use colon for subtitle"), but they were authoritative and controlling and did not encourage students to discover answers on their own.

Positive comments about development were well understood only 23% (3/13) of the time, even though best practices advise teachers to write positive comments. Straub (2000) even suggested that half of teachers' comments should be positive (in which case teachers will need to develop much better strategies for making these comments understood). It should be noted that the positive comments in the sample were usually fragments (which were well understood only 25% [38/152] of the time), and fragments are traditionally criticized. Although "good job" and "nice intro" are quick and easy to write, they did not lead to comprehension by their student audience, so they may have little effect. Though more time-consuming, positive comments that expand on the reason for the praise (such as "nice logical division between 'notes' and 'warnings' ") stand a better chance of helping students understand what aspect of their work they should attempt to replicate in future papers.

The importance of explanations. Two form focuses (style and word choice) were much more likely to be recognized when written by engineering teachers than by writing teachers, or vice versa, so these focuses deserve particular attention. Which characteristics differentiate the comments that are recognized and understood from those that are not? In each case, the presence or absence of explanations seemed to be the most important factor.

Style comments were much less likely to be recognized when written by engineering teachers (50%, 15/30) than by writing teachers (80%, 35/44). The phrasing, specificity, and presence of explanations in the comments appear to affect whether they were recognized and also whether they were understood. Regarding phrasing, no questions were recognized as style comments, although they made up 20% of unrecognized engineering style comments. It should be noted, however, that only three questions were present in the style portion of the sample. Specificity was very important, with 93% (14/15) of recognized engineering style comments being text specific compared with only 73% (11/15) of the unrecognized comments. Text-specific style comments make a direct link to the student's text, such as quoting the student's words in the comment, editing in-line, or underlining or circling a word or phrase in the paper. Most helpful for engineering faculty members, though, was including an explanation in their style comments. An explanatory statement, such as "watch passive voice," was present in 40% (6/15) of recognized style comments written by engineering teachers, but in only 7% (1/15) of the unrecognized comments. Eighty-six percent (6/7) of engineering style comments that included an explanation were recognized by students as style comments. Combining specificity and an explanation (such as "watch passive voice" alongside an underlined passive verb) was also helpful but not as necessary. Twenty-seven percent (4/15) of recognized style comments met this combination of characteristics, and 75% (3/4) of such comments were recognized. Although the use of explanations seemed to be very important in helping students recognize style comments written by engineering teachers, it did not seem to be needed for style comments written by writing teachers, which were generally recognized with or without explanations. Students might simply be more likely to expect style comments from their writing teachers.

In addition to helping students recognize style comments that engineering teachers wrote, comments that included explanations also helped students understand the reason behind these comments, and this effect was greater for comments by engineering teachers than those by writing teachers. Among well-understood style comments written by writing teachers, only 17% (3/17) included explanations. However, for engineering teachers, the percentage increased to 38% (3/8). So, it seems important for engineering teachers to cue students about the reason for their style comments, perhaps because students are not expecting style comments from their engineering teachers or because they have not been taught style in their engineering classes.

In contrast to style comments, word choice comments were much less likely to be recognized when written by writing teachers (57%, 4/7) than by engineering teachers (79%, 11/14). This finding is surprising because it

would be logical to expect that exposure to writing course content and the students' expectations of the writing teachers' priorities would help students recognize word choice comments more readily when seeing them on a writing class paper than on an engineering class paper, just as seems to be the case with style comments. Again, explanations seemed to be the most important factor for understanding, but in this case, writing teachers' comments as well as engineering teachers' comments seemed to need explanations. In fact, all word-choice comments that included explanations were well understood. For example, engineering teachers wrote word-choice comments such as "careful because this word is used in many ways," "the common term for this is 'weeping,'" and "not professional sounding." However, writing teachers did not write explanations in any of their word-choice comments; they wrote nearly all of these comments as in-line edits. Engineering teachers wrote explanations in 43% (6/14) of their word-choice comments, and apparently, as a result, their comments were better understood. The analysis of these two form focuses suggests that inclusion of explanations is important for students' understanding. According to Patchan, Charney, and Schunn (2009), writing teachers are more likely than are disciplinary teachers (in particular, psychology teachers) to include explanations in their comments, especially comments about macro issues of prose. This study indicates the importance of the explanations that Patchan, Charney, and Schunn saw and suggests that writing teachers also do not include them as often as needed for student understanding. Although students can understand comments by writing teachers in some form-focused areas without explanations, including the explanation increases the likelihood that a student understands a comment and, in some cases, can be necessary.

Perceptions of Helpfulness

Participating students were asked to note the comments that they considered particularly helpful and unhelpful and to explain why. They noted 268 comments (about 30% of all comments), 76% of which they identified as helpful and 23% as unhelpful. Several characteristics distinguished comments perceived as helpful from those perceived as unhelpful. First, and not surprisingly, the extent to which a student understood the comment's focus and reasoning played a role. Among comments perceived as helpful, 58% were well understood, whereas only 38% of those perceived as unhelpful were well understood. It is interesting to note, however, that 24% of comments perceived as helpful were not well understood, suggesting that students attempt to apply some comments without grasping their meaning. Second, some elements of phrasing mattered. Edits accounted for a substantial portion (20%) of the helpful comments, whereas fragments accounted for

a substantial portion (19%) of the unhelpful comments. Third, comments perceived as unhelpful were more likely to be written by engineering faculty. Of the comments identified by students as unhelpful, 63% were written by engineering faculty, whereas 38% were written by writing faculty. Comments perceived as helpful were somewhat more likely to be written by writing teachers (54%, compared with 45% engineering).

Other factors that might be expected to affect students' perception of helpfulness did not appear to be important factors. For example, negative and positive comments were each just as likely to be perceived as helpful or as unhelpful. The focus of the comment also had little effect. About one quarter of both helpful and unhelpful comments were focused on developing ideas, and other focuses were also fairly even between the two groups. However, technical approach comments made up a slightly larger portion of the comments perceived as unhelpful (13%, compared with 9% of the helpful comments), and design comments made up a slightly larger portion of the comments perceived as helpful (14%, compared with 9% of the unhelpful comments). These differences coincide with the larger number of engineering comments overall in the unhelpful category and the larger number of writing comments overall in the helpful category, because engineering teachers wrote all the technical-approach comments in the sample and writing teachers wrote more of the design comments, though it is unclear whether the focus or the writer of the comment had the most effect on helpfulness.

In general, students' explanations for their perceptions of helpfulness or unhelpfulness were fairly consistent. Regarding unhelpful comments that were well understood, students tended to feel that they already knew the information ("I guess it's something he felt he had to mark, but I already knew that.") or that the comment did not provide an explanation for its evaluation ("It's not really useful because he doesn't state what he means."). When students did not understand a comment and found it unhelpful, they usually cited as their reason that the comment did not provide an explanation, was unclear, or simply was not considered important by the student ("I don't get that, but it doesn't seem like it would help me in the future anyway."). Clearly the extent to which a student understood a comment affected its helpfulness, but the extent to which the comment enabled the student to improve his or her work was perhaps most important. Comments perceived as helpful, whether well understood or not, were most often considered helpful because they told how the student could improve the current or the next paper. For example, one member of a student team said,

> If he didn't make all these comments, we probably would have just went over it and been like, what the heck . . . There's so much, in this report, that he wants us to cover and make sure we have, that we're, ultimately, going to miss stuff.

> A lot of the stuff we could have caught, but some of it, it just wouldn't have been possible. But now we know, when we do it again, we'll probably sit down with the book and make sure every single aspect is covered because of all the comments he put.

The finding that students appreciated comments that helped them improve is encouraging because it suggests that students see comments as sources of help and teaching.

CONCLUSION

In this study, students understood the focus of approximately three quarters of teachers' comments. Students found form comments easiest to recognize, tended to confuse more complicated content-related comments (such as coherence comments) with the very common development-of-ideas comment, and were less likely to recognize the less common types of comment. The problems grow more widespread and more significant, however, when the students' understanding of the reason for the comment is examined. Students understood the reasons for comments only half the time. In general, the lack of understanding cut across categories of comment focus, although students did have a greater tendency to simply discount (and therefore not attempt to understand) form and validity comments. Students were more likely to disagree with these comments or to view them as simply rule based and therefore not worthy of in-depth understanding.

Whereas the focus of most comments was not strongly associated with the extent to which students understood them, some other commenting characteristics did seem to have considerable effect. In particular, the following types of comments tended to be well understood: directive comments (such as edits and commands) about content or mechanics, comments that include explanations of the comment's reason, minimal marking of mechanics, and readerly and coaching comments about development of ideas. The following types of comments tended *not* to be well understood: positive comments, fragments, and edits related to nonmechanics form issues such as style. Students' perception of the helpfulness of comments generally paralleled these findings, with students perceiving as more helpful the comments with characteristics that were associated with better understanding.

Some of these findings confirm previous research about best practices in commenting. First, the inclusion of an explanation of the reason for a comment has been identified as a best practice (Straub, 2000) and as a characteristic that students prefer (Straub, 1997). In this study, comments that included explanations tended to be well understood, probably because those comments explicitly provided to the student the reason for the comment.

Students in this study also noted these types of comments as particularly helpful. Second, minimal marking of mechanics (but not more complex form-related comments such as style comments) has been suggested as a best practice (Straub, 2000) and was well understood by students in this study. Third, coaching comments, particularly those that pose questions to the student, are recognized as a best practice (Anson, 1989; Straub, 2000) and were well understood in this study for comments about development of ideas. Previous research has indicated that students do not prefer these comments (Ziv, 1984), but the expected learning benefits and this study's finding that the comments are well understood suggest that they should remain a best practice.

Other findings in this study contradict established best practices. First, positive comments are considered a best practice (Gee, 1972; Straub, 2000), but students in this study discounted them, and those comments were not well understood. In this study and in some previous studies (Smith, 1997), positive comments tended to be written as fragments and placed in predictable locations, and these characteristics could cause them to be discounted or to be less well understood when students do attend to them. However, in this study, even less conventionally written positive comments tended to be discounted and therefore were not well understood because the student did not choose to take seriously the reason for the comment. To benefit from positive comments that are expected by researchers who deem them a best practice, teachers may need to state more explicitly in the positive comment that the student should "do more of this" in the paper or in future papers. According to this study, students generally attend to and find helpful comments that provide explicit instructions for improvement.

Second, and perhaps most significant, this study's findings about directive comments contradict best practices. Directive comments are not considered a best practice (Straub, 2000), but students in this study preferred them and tended to understand them. Comments structured as commands and edits (even for focuses such as development of ideas) were highly directive and were also more likely to be well understood. Though some might suggest that the disciplinary culture of engineering predisposes students to directive comments, it is also the case that directive comments simply require less intellectual work to understand and to apply and are therefore naturally more likely to be understood.

What does this finding mean for our beliefs about best practices of response? It is crucial for our students to understand our comments, of course, but our best practices advise us to help students achieve this understanding by thinking through problems rather than being explicitly directed to the solution. We generally seek to involve students in wrestling with messy, ill-structured problems, especially because knowledge gained in this

way is more likely to transfer to new situations. Perhaps we must accept that some students simply will not understand nondirective comments on their own and then make efforts to help them understand and use the comments. Or perhaps we need different best practices for different stages of learning, gradually relinquishing control to the student by writing less directive comments over time or as the student demonstrates competency. Perhaps students need directive comments at earlier stages of learning. This study also suggests that the addition of an explanation to the directive comment could further encourage learning; it could also promote transfer of the knowledge.

Gaining insight into student understanding of comments is a first step. Further research is needed on student understanding, as well as on the implications of this study's findings. This study is limited by the sample size and the engineering context; a larger study could allow study of the effects of comment characteristics for each focus, for example, and therefore provide a fuller picture of the effects on student understanding. Additional research is especially needed on explicit, directive comments. Are directive comments more helpful in earlier stages of learning and less necessary as students demonstrate more competency? What are the effects on understanding and student improvement of the inclusion of a directive solution in an evaluative comment rather than simply providing the evaluation alone? Are students better able (or more willing) to understand suggestions phrased as coaching questions rather than those paired with authoritative evaluations?

More study is also needed of the relationship between understanding, learning, and transfer of knowledge. Do students improve their writing more when they receive comments that tend to be well understood? Are students who receive comments that include explanations more likely to improve their writing and transfer that improvement to new situations? Studies of student revision have previously produced unclear results about the effects of comments on revision and transfer. A study that incorporates examination of the extent to which the comments are understood as well as the extent to which they are used might provide more conclusive answers. This study also points to the need to investigate ways of training both disciplinary and writing teachers to produce more comments that tend to be well understood and to examine whether these changes in response practices produce better understanding and learning.

ACKNOWLEDGMENTS

This study was made possible by the generosity of the teachers and students who provided a window into the intellectual work of commenting and

understanding comments. I appreciate their time and insights. I also thank second rater Madeline Wood and the anonymous reviewers for their assistance. This study was supported by a research fellowship from the College of Architecture, Arts, and Humanities at Clemson University and by a grant from the Campbell Chair Endowment at Clemson.

REFERENCES

Anson, C. (1989). Response styles and ways of knowing. In C. Anson (Ed.), *Writing and response: Theory, practice, research* (pp. 332–336). Urbana, IL: National Council of Teachers of English.

Brinkman, G. W., & van der Geest, T. M. (2003). Assessment of communication competencies in engineering design projects. *Technical Communication Quarterly*, *12*, 67–81.

Chapin, R., & Terdal, M. (1990). *Responding to our response: Student strategies for responding to teacher written comments*. (ERIC Document Reproduction Service No. ED 328 098).

Cohen, A. D. (1991). Student processing of feedback on their compositions. In A. Wenden & J. Rubin (Eds.), *Learner strategies in language learning* (pp. 55–69). New York: Prentice Hall.

Connors, R. J., & Lunsford, A. A. (1993). Teachers' rhetorical comments on student papers. *College Composition and Communication*, *44*, 200–224.

Dannels, D. P., & Martin, K. N. (2008). Critiquing critiques: A genre analysis of feedback across novice to expert design studios. *Journal of Business and Technical Communication*, *22*, 135–159. doi: 10.1177/1050651907311923.

Elbow, P. (1973). The teacherless writing class. In *Writing without teachers* (1st ed.; pp. 76–116). New York: Oxford University Press.

Ferris, D. R. (1995). Student reactions to teacher response in multiple-draft composition classrooms. *TESOL Quarterly*, *29*, 33–53.

Ferris, D. R. (1997). The influence of teacher commentary on student revision. *TESOL Quarterly*, *31*, 315–339.

Ferris, D., & Roberts, B. (2001). Error feedback in L2 writing classes: How explicit does it need to be? *Journal of Second Language Writing*, *10*(3), 161–184. doi: 10.1016/S1060-3743(01)00039-X.

Gee, T. C. (1972). Students' responses to teacher comments. *Research in the Teaching of English*, *6*, 212–221.

Hyland, F., & Hyland, K. (2001). Sugaring the pill: Praise and criticism in written feedback. *Journal of Second Language Writing*, *10*(3), 165–212. doi: 0.1016/S1060-3743(01)00038-8.

Maylath, B. (1998). Do we do what we say? Contradictions in composition teaching and grading. In F. Zak & C. C. Weaver (Eds.), *The theory and practice of grading writing: Problems and possibilities* (pp. 31–36). Albany: State University of New York Press.

Miller, P., Bausser, J., & Fentiman, A. (1998). Responding to technical writing in an introductory engineering class: The role of genre and discipline. *Technical Communication Quarterly*, *7*, 443–461.

Olson, M. W., & Raffeld, P. (1987). The effects of written comments on the quality of student compositions and the learning of content. *Reading Psychology*, *8*(4), 273–293. doi: 10.1080/0270271870080404.

O'Neill, P., & Fife, J. M. (1999). Listening to students: Contextualizing response to student writing. *Composition Studies*, *27*, 39–51.

Patchan, M. M., Charney, D., & Schunn, C. D. (2009). A validation study of students' end comments: Comparing comments by students, a writing instructor, and a content nstructor. *Journal of Writing Research*, *1*(2), 124–152.
Patton, M. D. (2003). Research or faculty development? A study of WI faculty commenting. *Journal of the Council of Writing Program Administration*, *27*(1–2), 75–91.
Smith, S. (1997). The genre of the end comment: Conventions in teacher responses to student writing. *College Composition and Communication*, *48*(2), 249–268.
Smith, S. (2003a). The role of technical expertise in engineering and writing teachers' evaluations of students' writing. *Written Communication*, *20*, 37–80.
Smith, S. (2003b). What is ''good'' technical communication? A comparison of the standards of writing and engineering instructors. *Technical Communication Quarterly*, *12*, 7–24.
Sommers, N. (1982). Responding to student writing. *College Composition and Communication*, *33*, 148–156.
Sperling, M., & Freedman, S. W. (1987). A good girl writes like a good girl: Written responses to student writing. *Written Communication*, *9*, 343–369.
Straub, R. (1997). Students' reactions to teacher comments: An exploratory study. *Research in the Teaching of English*, *31*, 91–119.
Straub, R. (2000). *The practice of response: Strategies for commenting on student writing*. Creskill, NJ: Hampton Press.
Straub, R., & Lunsford, R. F. (1995). *Twelve readers reading: Responding to college student writing*. Creskill, NJ: Hampton Press.
Taylor, S. S. (2007). Comments on lab reports by mechanical engineering teaching assistants: Typical practices and effects of using a grading rubric. *Journal of Business and Technical Communication*, *21*, 402–424. doi: 10.1177/1050651907304024.
Taylor, S. S., & Patton, M. D. (2006). Ten engineers reading: Disjunctions between preference and practice in civil engineering faculty responses. *Journal of Technical Writing and Communication*, *36*, 253–271.
Ziv, N. (1984). The effect of teacher comments on the writing of four college freshmen. In R. Beach & L. S. Bridwell (Eds.), *New directions in composition research*. New York: Guilford.

Summer Smith Taylor (October 29, 1971–February 15, 2011) was an associate professor of English and director of the MA in professional communication at Clemson University. She studied writing assessment, especially the teaching and assessment of writing in engineering.

APPENDIX

Definitions and Examples of the Categories of Focus

Content Evaluations

Development of ideas: Evaluation of whether enough information is provided

Validity: Evaluation of the truth of information in the text

Coherence: Evaluation of the continuity and relevance of ideas; evaluation of the unity and clarity of purpose

Organization: Evaluation of the location and order of ideas, information, and sections; evaluation of the division of the text into sections

Rhetorical effectiveness: Evaluation of the accommodation of the audience's needs

Technical approach: Evaluation of the engineering choices, including choice of topic and methodology

Completeness: Identification of presence or absence of required report features

Form Evaluations

Mechanics: Evaluation of correctness of spelling, punctuation, capitalization, and basic grammar

Style: Evaluation of structure, conciseness, readability, and tone at the sentence level; includes evaluation of choice of tense, voice, and person

Word choice: Evaluation of appropriateness of specified words or phrases; includes mention of repetition of a word in a sentence or paragraph

Design: Evaluation of the appearance of the page or elements of the page; evaluation of placement of elements on the page

Holistic Evaluations

Holistic: Evaluation of the quality of the entire paper or of a substantial section

Effort: Evaluation of the level of effort demonstrated by the student