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What’s so important about peer review of teaching portfolio components? An exploratory analysis of peer review episodes

Abstract: Understanding and promoting effective teaching are central concerns of the engineering education community. In this paper, we report on research to investigate the processes by which construction of teaching portfolios in a socially supportive context can promote the advancement of teaching knowledge and ability. We believe that by characterizing how one specific intervention can advance teaching knowledge and effectiveness, we can generate findings and ideas that can help others engaged in the same goal.

Introduction

Understanding and promoting effective teaching are central concerns of the engineering education community since effective teaching can not only improve student learning, but also increase student motivation, persistence, and retention. Because teaching is complex, the approaches for improving teaching are necessarily diverse. Approaches include workshops on specific teaching techniques, individual consultations where educators get advice on individual challenges, creation of websites and books with teaching information, and development of communities of practice around teaching. But what do we know about practices such as these? Answers to this question, and strategies for answering this question, can be of interest to those faculty developers, instructional consultants, and others who are interested in helping educators advance their teaching.

Any approach to advance teaching will likely need to address two issues. First, the approach will need to be a learning event in that teachers are succeeding in learning something (e.g., new teaching techniques, new ways to think about students) that will help them improve their teaching. This might be considered effectiveness by traditional definitions. Second, the approach will need to fit into the complex schedules and contexts of educators since simply spending time learning about teaching may not be possible. For example, given that engineering educators (and future educators in the form of graduate students) are busy, approaches may need to help them solve actual problems they are encountering or be aligned with other requirements that the educators must meet (e.g., preparing materials for annual merit review or tenure review, getting a job). Such a framing suggests two questions that can be asked for any approach to help educators become better educators: a) to what extent does the approach lead to learning of knowledge and skills related to teaching and b) what outcomes other than learning about teaching do participants derive from the approach.

In our work, we have been focusing on one particular strategy – having individuals (primarily future engineering educators in the form of graduate students) create teaching portfolios through a scaffolded process and in a group oriented environment. Participants in our Engineering Teaching Portfolio Program (ETPP) prepare a teaching portfolio consisting of a teaching philosophy, two to five annotated artifacts, and a diversity statement. Peer review defined as reciprocal evaluation of written products was originally conceived as a core element of the program. Participants typically use at least half of each session to review the portfolio elements of their peers. To date, our research on this educational innovation has focused on the
intertwined activities of exploring the learning outcomes associated with participation and the processes associated with participation. This current study is focused on that latter activity. In alignment with the ideas above, we are interested in ETPP as a learning event—in how the individual and social processes associated with building a teaching portfolio can lead to advancement of teaching knowledge and ability. At the same time, we recognize that we are helping graduate students create materials that can help them become more competitive on the job market.

Over time, we have collected evidence suggesting that the peer review periods may be particularly important from both a learning and participant outcome perspective—we consistently observe a great deal of energy during the peer review sessions, we often hear what sound like probing discussions, and participants repeatedly list peer review as the most significant and valuable component of the program. These and other indicators have led us to identify the peer review activities (and the activities surrounding peer review) as one of the most important elements of the Engineering Teaching Portfolio Program. By developing a greater understanding of what is going on during these periods, we believe we will be able to improve not only our own program but also provide insights to others who are creating approaches to improve teaching.

The following question motivates the work presented in this paper: what is going on during the ETPP peer review sessions that would explain why researchers and participants alike point to it as an important element of the program? In this paper, we present an analysis of the activities in four different peer review sessions selected to cover a range of issues. In the results, we focus on describing the types of activities that we identified and comment on the opportunities for learning created by these activities. In the discussion, we focus on the addressing the questions about learning and additional participant outcomes introduced above. In a section following the discussion, we explore additional learning theories with the potential to guide us in making stronger inferences about the learning afforded by the experience. We close by commenting on the relevance of this work for various audiences.

**Method**

In this paper, we address the research question in the context of data collected from our 2003 offerings of the Engineering Teaching Portfolio Program. During the summer of 2003, we made our program available to all graduate students and post-doctoral fellows who expressed interest. Due to demand, we formed two eight-student sections of the program. Ultimately, these sections came to be known by their weekly meeting day, the Tuesday section and the Wednesday section. During these offerings, we collected a comprehensive set of field notes that aimed to capture in real-time as much of the session interaction as possible. In a sense, the field notes represent a quasi-transcription of the discourse during each session (who was speaking, what they were saying).

The analysis reported in this paper focuses on a subset of that larger dataset. In particular, we chose to focus on the field notes from four sessions. These sessions were chosen to illustrate peer review during an early phase of the program (week 3) and a later phase of the program (week 7). We also chose these sessions because they were peer review intensive in that participants were focused on first drafts of the teaching philosophy statement and diversity...
statement. Further, we chose these sessions in order to capture the activities of the two different participant groups in order to broaden our understanding of the findings.

Our approach to answering our questions is situated in the emerging tradition of “making work visible”\textsuperscript{4}. In this view, the idea is that answers to questions related to the nature of work and the meaning of work (such as our driving question about importance) are thought to come from a detailed understanding of the activities performed by participants. As a result, we sought to describe the activities in a way that would shed light on the dual issues of a) the learning of knowledge and skills related to teaching, which are potentially important to both the program developers and the participants and b) participant outcomes other than learning about teaching, which are likely more important to participants than to program developers.

We chose an inductive approach to data analysis in order to stay sensitive to the types of activities present in the data\textsuperscript{5-6}. In particular, we chose to code at the level of activity and use our understanding of the activities to make inferences about the two phenomena of interest: learning and additional participant outcomes. In order to make inferences about learning based on the activities resulting from this inductive approach, we chose initially to focus on basic notions of learning as acquisition of new knowledge and refinement of existing knowledge.

Four coders participated in the process of developing the codes and coding the dataset. We began by identifying candidate codes using the field notes we had selected as well as all of our collective prior experiences with ETPP including participation in and observation of prior sessions as well as participation in sessions that were going on concurrent with the data analysis. Through discussion and negotiation, we arrived at a final set of codes. Finally, one coder revisited the entire dataset using the finalized codes. Because our codes are not mutually exclusive, it is possible for passages from the notes to be coded using more than one code.

It is interesting to note that all of the coders had had first hand experience with the program in some form: one coder had been a participant in two of the sessions being analyzed, had helped design the program, and had been a program facilitator on two occasions; one coder had helped design the program; another coder had recently been a program facilitator, and the final coder was a participant in the session offerings that were concurrent with our analysis. While such prior knowledge could serve to bias the results, our constant negotiation of the coding activity made it difficult for such biases to go unchecked. Rather, we found that the extensive and diverse experiences with the program helped us to make sense of the data.

\textbf{Results}

In this section, we discuss the range of activities that we identified through the coding of the peer review sessions we analyzed, and briefly discuss the implications of these different activities in terms of learning. Appendix 1 provides a more detailed account of the coding that resulted in the description below. In particular, the appendix identifies the exact codes we used and provides examples of participant interaction illustrating each of the codes.

\textbf{Audience.} Participants discussed a number of issues related to audience, including discussions of the intended reader (e.g., characteristics, attributes), the identification of context of that reader and the portfolio (e.g., how a participant's teaching philosophy statement might be more suited to
a research extensive institution rather than a teaching focused institution or a discussion of what community colleges look for in faculty candidates and how a participant could edit their portfolio accordingly), and the general issue of managing audience reactions (e.g., reactions to a particular statement). By raising questions and sharing information related to audience, participants had the opportunity to learn more about the audience of their portfolio which is, in turn, the context in which they will be teaching and their potential set of peer educators.

**Genre negotiation.** A portfolio, and the specific items within the portfolio (teaching philosophy, diversity statement, teaching artifacts), can each be considered a genre in that they are specific, socially understood forms associated with norms about content and structure. In looking at the conversations of the participants, we were able to identify examples of interactions focused on negotiating the nature of this genre in terms of defining what the portfolio or portfolio elements 'should' be. For example, participants discussed issues such as length of the portfolio elements (e.g., how long should the teaching philosophy be), appropriate tone, voice, or style (e.g., is it okay for it to be personal, first person vs. third person), and number of different elements (e.g., how many artifacts to include). Clearly, by discussing and negotiating the genres related to a portfolio, participants would have the opportunity to develop a better sense of these genres. Further, because these genres have to do with general issues of a) meshing personal views with accepted best practice and b) providing evidence; participants could have the chance to develop more sophisticated ideas about these issues.

**Writing.** Creation of a portfolio is a writing intensive activity, and thus it is also unsurprising that participant comments focused on the written nature of the activity. Participants spent time discussing writing processes as well as commenting on each other’s writing from the perspective of an editor. For example, participants discussed their process for how they went about writing a portfolio element, such as discussions about how they initiated the writing process and where they got ideas or models for how to begin writing a portfolio element such as a teaching philosophy statement. Unsurprising given the context, we also noted participants giving and receiving specific feedback about writing issues such as but not limited to copy editing, organizing content, and grammar.

In terms of learning, discussion of writing processes (specifically discussion of problems and solution strategies) and the receiving of feedback on their written products create the potential for students to improve their writing ability *in general*. However, given the learning that is of interest (learning about teaching, advancing teaching ability), it is potentially important to question when the discussion captured by these codes evolved into discussions more critical to improving teaching ability such as sharing of teaching information and clarification of one’s ideas about teaching.

**Clarification.** Participants also spent a significant amount of time asking each other for clarifications concerning various ideas articulated in their portfolio elements. For example, participants asked each other to clarify a) the attitudes, beliefs and/or conceptions suggested in the portfolio elements—teaching ABCs, b) the terminology or concepts mentioned or discussed in the portfolio element, and c) the evidentiary link between the portfolio artifacts and the claims in the teaching philosophy. In terms of learning opportunities, by asking each other for clarification, participants were helping each other see where explanations were not succeeding
and thus giving each other the opportunity to refine their understanding of their own ideas. In such cases, it is possible that the conversation ceased to be strictly about making a better portfolio and became a conversation about views of teaching and teaching knowledge.

**Sharing ideas.** The sharing ideas code captures instances where participants exchanged information. We noted participants sharing information in two forms: a) straightforward exchange of information and/or resources related to teaching practices or strategies and b) storytelling based on their personal experiences or the experiences of their friends or colleagues. In terms of learning, sharing ideas in this context not only brings potentially new information to the table (thus enabling learning), it also is likely to be bringing information that is relevant to the situation. As a result, participants would not only have the potential to learn new information but also to see its potential use.

**Positive reinforcement.** We noted instances of participants seeking and giving positive reinforcement such as in the form of reassurance (e.g., positive comments, encouragement, or support during the peer review about a portfolio element that is specifically related to reassuring the person receiving the peer review that their draft is worth pursuing). In terms of learning, such reinforcement could have paved the way for more open conversation about the content of the drafts being reviewed, and thus positioned the writer to be more open to hearing comments and ideas.

**Stage Fright.** We also noted participants expressing uncertainty about their writing or work and airing concerns that they had about the quality of their portfolio elements. This included abstract concerns, but also concerns about sharing these items with the intended audience. In terms of learning, having the opportunity to share such concerns may have helped the author get into a position where they were open to feedback and may have helped other participants know how to effectively frame feedback to that author.

**Task negotiation.** Participants spent a great deal of time engaged in figuring out what they were supposed to be doing, what they wanted to be doing, and how to go about doing it given the available resources and current conditions. This included at least three types of activity: a) negotiation of the structuring of activities related to peer review or any other business details associated with any aspect of the ETPP session, b) negotiation of the type of feedback participants wished to receive, and c) negotiation about how to handle absent friends/participants (e.g., how to get feedback about portfolio elements to participants who are absent). In terms of learning, activity captured by these codes can be seen as opportunities to practice facilitating group work. However, in terms of the learning that was of interest (learning about teaching, advancing teaching), the activity embodied by these codes can also be seen as the work that is necessary in order to pave the way for the type of interactions that are *really* important for the actual learning. As such, the issue represent by task negotiation becomes one of ensuring that the time required for task negotiation does not overwhelm, or put at risk, the more significant learning activities.

**Discussion**

In the previous section, we described the main categories of activity (seven categories that can be grouped into the four higher level categories of rhetorical, content, affective, and task
negotiation) that we identified in order to describe what is going on during the peer review sessions. Here in the discussion, we return to the questions posed at the beginning of the paper: a) what outcomes do participants derive from the approach other than learning about teaching and b) to what extent does the approach lead to learning of knowledge and skills related to teaching.

**What outcomes do participants derive from the approach other than learning about teaching?**

The coding of participant activity provides a basis for making inferences about the types of outcomes other than learning that participants would have been deriving from the peer review sessions. For one, participants were getting information that would lead them to create *improved written products*, something of interest to participants because of the role of these products in the job search process. For example, the activity coding shows that participants were getting advice on their writing (e.g., grammar and style issues), an opportunity to judge the effectiveness of their writing through clarification requests from the colleagues, information necessary to improve the documents through the genre negotiations and audience discussions, and even support for gaining confidence in their writing through the affective interactions. The clarification codes indicate that participants were encouraged to articulate and explain their portfolio elements—their peers challenged their conceptions of teaching, wished for evidence to back up the claims in their statements, or were unclear about the terminology used in their statements. By doing so, participants would have the opportunity to realize that the ideas in their portfolio elements were written in a way that might not be clear to their audiences. Many participants used this feedback to revise and modify their portfolio elements—and the time taken to incorporate the suggestions of their peers into their own work is in itself an indication that the participants who did this found the feedback valuable.

The results also suggest participants had the opportunity to experience a *productive collaborative writing environment*, one that likely differed from prior professional writing experiences (studies of writing in the workplace and in academia suggest that people perceive writing as a lonely activity) and prior classroom peer review experiences. We infer this from noting the degree to which positive reinforcement in the form of reassurance was present in all of the sessions coded. The level of positive reinforcement in these sessions is most likely less than what occurs in a typical engineering classroom, where typical feedback for a homework set or final project may be mostly about what the student did incorrectly rather than what was good about the work. We speculate that because this was a peer environment, in which all of the participants were approximately at the same level, participants were tactful and reassuring about the feedback they gave because they knew that they would be receiving feedback from their peers about their work and hoped at some gut level that their work would be received respectfully. Therefore, the issue of positive reinforcement was most likely highly linked with the issue of stage fright, which was also present in all of the sessions.

The results also suggest that some participants may have had the opportunity to increase their *confidence in their ideas about teaching and their ability to articulate them*. The affective activities of stage fright and positive reinforcement suggest limitations to the confidence initially. Further, the activities of clarification suggest opportunities for participants to revise their ideas.
To what extent does the approach lead to learning of knowledge and skills related to teaching?  
As the previous section highlights, the activities associated with the peer review sessions provide a good basis for making inferences about outcomes other than learning outcomes that participants would have been able to derive from the peer review activities. We believe that the activities also provide a strong basis for making inferences about the peer review sessions as a site for significant learning of knowledge and skills related to teaching. In particular, we see evidence of two types of learning mechanisms: information exchange (new information) and knowledge revision. Concerning information exchange, our coding captured instances of participants sharing teaching information in both declarative and narrative (story) forms. In addition, some of the information sharing attributed above to improving the written products (specifically the information about audience such as the context information) can be considered also relevant teaching information in that such information can help educators make effective choices about how to teach. Concerning knowledge revision, the activity of content clarification can be tied to learning by recognizing that when one’s writing is unclear it can stem from a lack of clarity in the underlying knowledge. As a result, when the participants were engaged in thinking about how to clarify their ideas, they may have well been engaged in actually improving their underlying knowledge base. The following section extends these ideas about possible learning opportunities by turning to a discussion of three learning theories that can help us get more specific about the nature of the learning that could have been occurring in the context of the peer review.

Turning to Learning Theory to Strengthen Claims about Learning

How can theories of learning beyond the general view presented in the methods section can help us better understand the learning opportunities created by peer review? As part of an effort to address this question, we have explored a number of theories. For example, we have looked to general theories of learning such as the view of learning as a process of constructing meaning from prior experiences and incoming stimuli\(^7\), theories of learning specific to activities and/or learner populations such as theories of learning in continuing professional education\(^8\), theories of learning through design activity\(^9\), theories of the nature of learning supported by collaborative activity\(^10\), theories of learning as a natural part of participating in communities of practice\(^11\), theories of learning through writing\(^12\), theories of how organizations and individuals in organizations learn\(^13\), and theories of learning as a transformative activity\(^14\).

Because our coding focused on how students were interacting and what information they were sharing, we are particularly interested in theories that map activities to learning opportunities. Below we explore three of the above theories in greater detail (the latter three). In each case, we explain the aspect of our peer review phenomena that suggests a mapping to the conditions of the theory, describe the theory, and comment on how the theory helps us understand the learning opportunities more specifically.

Writing as a Knowledge Transformation Process (Bryson, Scardamalia and Bereiter). In our context of interest (portfolio construction), writing forms the core of the activity. In particular, participants are asked to prepare (write) a portfolio consisting of a variety of written elements including the teaching philosophy, the artifact annotations, and the diversity statement. Moreover, the peer review is relative to writing that has just taken place. It is thus interesting to consider how the processes of writing and revising these written elements can have learning
about the content of the elements (i.e., teaching knowledge) as a natural by-product.

In their work, Bryson, Scardamalia and Bereiter sought to account for how, for some writers, the processes of writing lead to substantive changes in the writer’s knowledge about the subject matter underlying a composition. As a result, the goal of their theory is to account for how writing itself can be a transformative learning process, particularly a process that results in the transformation of knowledge associated with the content or subject matter of the writing. According to the theory, learning is the result of problem solving such that solutions to problems represent new knowledge and thus learning. Further, the theory identifies two distinct forms of problem solving involved in writing – rhetorical problem solving and content problem solving.

- Rhetorical problems are those associated with how to explain the content to a given audience using a given genre. Solving rhetorical problems would thus lead to greater writing proficiency/expertise.
- Content problems are those associated with what is known about the content. Content problems come about when the author realizes that he/she doesn’t have sufficient knowledge about the content in order to fully solve the rhetorical problem at hand and thus must embark on a search for new content knowledge. The identification and solving of content problems is the process by which writing is thought to lead to transformations in content knowledge.

This theoretical perspective applied to our situation leads to the idea that mapping the theoretical perspective to our situation lies in looking for instances of problem solving, and, in particular, instances of content problems in addition to rhetorical problems. Looking to our results with the idea of problem solving in mind, it seems easy to see many of the codes as part of problem identification activities and/or the sharing of information to help solve problems. For example, it can be argued that the following codes represent efforts to identify/address different types of problems: clarifications (problems a reader is having), managing audience reactions (problems future readers might have), positive reinforcement (the problem of the writer needing guidance on how to judge work), stage fright (the problem of the writer not having confidence in work), writing—editor review (copy editing problems), task negotiation—feedback (the problem of articulating the types of problems a writer would like to see identified.) Similarly, it can be argued that the following codes represent efforts to provide information for problems solving: audience—intended reader (information about the audience), audience—context information (information about the audience), genre negotiation (information about the genre), sharing ideas—storytelling (information that is easier to communicate in a narrative), sharing ideas—teaching strategy (information about teaching), and writing processes (information about writing strategies). It also seems relatively straightforward to think of the problems and information represented in our results from a rhetorical perspective (issues of audience, genre and purpose) and from a content perspective (here issues of teaching).

The above comments demonstrate the feasibility of mapping this theoretical perspective to our data. As a result, it seems clear that further investigation of this perspective would permit us to make claims about participants’ learning of writing strategies (e.g., how to write an effective philosophy statement) and participants’ learning of knowledge and skills related to teaching. Next steps might include a content analysis of the passages already coded with the relevant codes listed above (to get a glimpse of the types of content and rhetorical problems present in the
interactions, and thus the specific learning opportunities) or even a recoding of the data focused on identifying rhetorical and content problems directly. Given such additional recoding, we could then look at the balance of rhetorical and content problems to learn about the ratio of these two types of learning opportunities and investigate how these types of learning opportunities are distributed across individuals and the group (to understand who might have been learning what). We might also consider looking for evidence of these types of learning opportunities in our other data sources (e.g., interviews).

**Organization Learning, Problem Solving, and Story Telling (Brown and Duguid).** Another way to characterize the peer review sessions is as a “work context” in which participants are coming together in order to accomplish a surface “work” goal of creating a teaching portfolio. This suggests that we could turn to forms of organization learning theory that seek to explain how the activities of job performance and learning are transparently interwoven in some work activities.

For example, Brown and Duguid suggest a theory of learning in which learning occurs through joint problem solving when stories from different members of the community are brought to bear on the problem at hand. The learning results from the sharing of the stories (which embody soft knowledge, knowledge difficult to represent using propositions) and from the seeing of the stories in a new light. In their paper, Brown and Duguid illustrate these ideas through a single case study. In their case study context, the knowledge required for work was significantly grounded in stories that got shared as part of problem solving. They suggest that in such a case, when the key knowledge for a job lies in stories, then training becomes a problem of becoming a part of a community of practice. Key to this account of learning is the idea that learning is a by-product of natural community activity—problem solving for authentic problems.

This account of organization learning clearly aligns with activities we noted through our coding. As already discussed above, many of the codes can be framed as the identification of problems. Further, as also mentioned above and apparent in the coding, some of the information shared is in story form (i.e., Sharing Information—Storytelling).

The above observations demonstrate the feasibility of mapping this theoretical perspective to our data. This suggests that further investigation of this perspective would permit us to talk about the type of knowledge that participants had the potential to acquire, specifically the high-context, situationally embedded nature of the knowledge that is embodied in stories. Further, with content analysis of the actual stories being traded, we could also comment on the specific high context teaching knowledge participants may be acquiring. Since the stories being exchanged seem to be primarily about teaching, this perspective would really emphasize the learning about teaching that occurs rather than other types of learning such as learning more effective writing strategies. Next steps could include an analysis of the content of stories that have been identified and an emphasis on linking these stories to problem that provoked their telling (if such a problem existed).

**Transformative Learning Theory (Mezirow).** The theories described in the previous two sections do not explicitly take into account the characteristics of the participants in the ETPP program, specifically characteristics that are relevant to their role as learners. In particular, our
data reflects the activities of adult learners (graduate students and post-docs) who had a range of prior teaching experiences. Transformative learning theory is a theory with potential to take this feature of our situation into account.

Transformative learning theory is a theory of learning that stems from adult education and seeks to explain instances where learner has more experience and significant commitment to prior beliefs and where the learning is a process of reflecting on experience outside of formal learning environments (i.e., at the workplace, at home). Reflection is considered key to transformative learning theory. In particular, critical reflection is thought to be the key process by which a learner transforms. Critical reflection is induced through a catalyst in the form of a significant dissonance. Such critical reflection can occur through one large catalytic event or a series of small, cumulative events.

In terms of our activity, we have adult learners who are engaged in an activity that has the potential to lead to critical reflection. A thread running through our interpretation of the activities of these learners is that their activity can be framed as the joint raising of problems and followed by limited efforts to solve those problems. In terms of transformative learning theory, it seems possible that some subset of the problems could have the qualities necessary to trigger critical reflection. The two codes that seem most promising for triggering critical reflection are the audience-managing reactions code (critical reflection might occur because of the stakes of polishing your ideas for a broader audience) and the clarification codes (when the clarification gets at something serious). It also seems possible that the two codes with emotional overtones, positive reinforcement—reassurance and stage fright, could be linked to critical reflection, since the emotional events tied to the codes seem particularly salient and catalytic.

As with the previous two theoretical perspectives, the above comments demonstrate the feasibility of mapping this theoretical perspective to our data. In this case, this suggests that further investigation of this perspective would permit us to get more specific about the fundamental conceptual changes that participants might have experienced. Further, we might be able to use this theoretical approach to look for evidence of participants changing from teacher-centered to learner-centered views of teaching, since this is one of the most discussed conceptual distinctions in the literature on teaching. Next steps could include revisiting the interactions around the promising codes we identified above to see if there is additional evidence of the catalytic events having triggered critical reflection. We could also complement that analysis with an investigation of other data (e.g., interviews) that could support inferences about an event as having triggered critical reflection.

**Concluding Remarks**

In this paper, we have been motivated by the overarching question of what is going on during the ETPP peer review sessions that would explain why researchers and participants alike point to it as an important element of the program. To this end, we have analyzed the types of activities present in four different peer review sessions and then used these activities to make inferences about the types of outcomes other than learning that participants were likely to have been experiencing as well as outcomes related to learning of teaching knowledge and skills. We believe our results support claims that the peer review was much more than simply a fuzzy experience, but rather provided a context for helping participants improve their written products,
helping participants grappled with the affective nature of talking about and sharing teaching ideas, and also helping participants learn knowledge and skills relevant to teaching.

We believe that these results, limited though they are, have the potential to be useful to those faculty developers and others who are interested in helping educators advance teaching. In particular, we think the that the methodology and results can be useful to those interested in doing a similar kind of analysis of teaching strategy, those interested in using peer review in the context of teaching development, and even to those simply interested in other approaches to helped educators become better educators.

Acknowledgements

This work has been supported by the National Science Foundation under the following grants: ESI-0227558, which funds the Center for the Advancement of Engineering Education (CAEE), and REC-0238392 (Using portfolios to promote knowledge integration in engineering education.)

Appendix I: Detailed Coding Results

In this section, we provide a thick description of the range of activities that occurred during the peer review sessions we analyzed. These results represent the range of activities one might expect people to do when engaged in peer review of teaching portfolio components. Specifically, we identify and define our key coding categories, briefly discuss the implications of these different activities in terms of learning, and, finally, show examples of participant interaction that illustrate the ideas captured by the coding category. These examples are labeled with the associated session number (in terms of week), section identifier (Tuesday or Wednesday), and participant code (Tuesday participants were indicated with S followed by a number while Wednesday participants were indicated with T followed by a number). The categories are shown in alphabetical order so that no particular activity is privileged in the listing. The next section focuses on the alignment between our results and three relevant theories of learning.

**Audience.** Participants discussed a number of issues related to audience. For example, the “Audience—Intended Reader” code captured any discussion, comment, or reference that mentions the characteristics, attributes, or anything else about intended reader, i.e. whoever is going to read the Teaching Portfolio whether this is peer reviewers, search committees, friends, or random people on the web. The “Audience—Managing Reactions” code captured discussions, comments, or references to how any given audience will react to an idea in a portfolio element. This code also refers to how the author of the document might control the audience reaction. Finally, the “Audience—Context Information” code captured any discussion, comment, reference, or sharing of information about a 'real world context' for the teaching portfolio or any portfolio element. Specific examples might include comments about how a participant's teaching philosophy statement might be more suited to a research extensive institution rather than a teaching focused institution or a discussion of what community colleges look for in faculty candidates and how a participant could edit their portfolio accordingly. Examples of these codes are shown below:

- Audience—Intended Reader
“S3: It seems like the faculty want to see that you have thought about your teaching, that it’s not something that you view that you have to teach classes on the side, so you think about it, show them that you have thought about teaching.” (Week 3, Tuesday)

“T5: In a sense you are talking about more than just your teaching view, you are talking about your view of engineering... I think this will stand out... I’m picturing a committee talking about your diagram....” (Week 3, Wednesday)

- **Audience—Managing Reactions**
  - “T6: I was hoping that some one wouldn’t read it and think it’s naïve; T1: I wouldn’t think it’s naïve, it’s more personal and grounded; in your own ideas so maybe it’s more strong” (Week 3, Wednesday)

- **Audience—Context Information**
  - “S5: ...been looking at teaching philosophy statements of people who got jobs at UW and Wisconsin. He says they are different. The vast majority don’t even have teaching statements and they still get jobs. Some people are using the teaching philosophy statement as a surrogate for the research statement, with bulk oriented toward graduate education and how research interests will fit into the teaching that they do. S5: I guess it depends on the job, kind of job, you’re looking for. I guess you would have radically different statements for different jobs.” (Week 3, Tuesday)

**Clarification.** Participants also spent a significant amount of time asking each other for clarifications concerning various ideas articulated in their portfolio elements. For example, the “Clarification—Teaching ABCs” code captured any incident or event in which participants ask for clarifications specifically regarding teaching attitudes, beliefs and/or conceptions (teaching ABCs). The “Clarification—Evidence” code captured any incident or event in which participants ask for clarifications links between statements (teaching philosophy and diversity statements) and evidence for the statements such as artifacts or artifact annotations. Finally, the “Clarification—Terminology” code was developed to capture any incident or event in which participants ask for clarifications about terminology or concepts mentioned or discussed in the portfolio element. Examples of these codes are shown below.

- **Clarification—Teaching ABCs**
  - “S5: The weakest paragraph was the first whole paragraph... I was confused by what you meant by making teaching personal. Did you mean that you make relationships personal or the subject personal to the students? S4: I think it’s both. I think it’s important to get to know your students and to keep the material interesting to the students.” (Week 3, Tuesday)

- **Clarification—Evidence**
  - “T1: artifacts... if you have written about oranges this would be great. Also you wrote about non-traditional ways of assessment... many people use student portfolios to assess... so you might be able to use this... If you have student evaluations and some evidence that you redid or changed a course in response to the feedback this would be a good thing to show...” (Week 3, Wednesday)

- **Clarification—Terminology**
“T4: I didn’t understand what you meant by reflection at first … then you explained later… it has a common meaning that might be confusing… maybe if you could define it early before you get to the examples.” (Week 3, Wednesday)

**Genre negotiation.** A portfolio, and the specific items within the portfolio (teaching philosophy, diversity statement, teaching artifacts), can each be considered a genre in that they are specific, socially understood forms associated with norms about content and structure. The “Genre Negotiation” code captured any event or incident in which participants work on defining what the portfolio or portfolio elements 'should' be, including issues such as length of the portfolio elements (e.g. how long should the teaching philosophy be), appropriate tone, voice, or style (e.g. is it okay for it to be personal, first person vs. third person, etc.), and number of different elements (e.g. how many artifacts to include). Examples of genre negotiation are shown below.

- Genre Negotiation
  - “S2: I don’t know where you put information about working with undergrads and grads in research. I don’t know where it goes…maybe a cover letter or something. S7: can mention how to mentor undergrads about how to do research. S2: I couldn’t figure out an obvious place to put it.” (Week 3, Tuesday)
  - “S5: What are the things that you feel strongly about? S2: I think it varies, there’s no set of items that should be in a teaching philosophy, it’s going to be unique for each person…” (Week 3, Tuesday)
  - “The length of it is too long.; S4: I don’t think 500 words is the magic limit.” (Week 3, Tuesday)
  - “T1: even a lot of the ones on line cited some stuff… I wondered about requiring citations… I thought it would look so weird; T4: I though citations were weird… try to phrase things in common language so you don’t have to use citations.” (Week 3, Wednesday)
  - “S3: Difficult part of the assignment, statement had to be rewritten for each application, for each institution. Should the statement be focused on families, older students, or race/gender/ethnicity, or the university is located in the heart of a particular group (community outreach), are they night/day classes, it all got jumbled in my head, and I got dizzy.” (Week 7, Tuesday)
  - “S4: So, I think you have a lot of good material to work with, you need to be more selective on what’s really important. Like, particularly towards the end, I tend toward structure. Here’s the main idea and here’s the evidence.” (Week 7, Tuesday)
  - “T5: in philosophy statement you sometimes preach… had to strike a balance between telling everyone how to do their job and then being personal; T2: in diversity statement it felt a whole lot harder to ‘do a brag’ about what you’ve done… in my opinion doing a good job of diversity is admitting that you are flawed… that you are aware of your shortcomings.” (Week 7, Wednesday)

**Positive reinforcement.** The positive reinforcement code captured instances where participants sought or provided support for the positive features of the current draft elements. One particularly salient sub-code in this category was the “Positive Reinforcement—Reassurance” code which captured any positive comment, encouragement, or support during the peer review
about a portfolio element that is specifically related to reassuring the person receiving the peer review that their draft is worth pursuing. Examples of this code are shown below.

- **Positive Reinforcement**
  - “S5: I liked the examples you used, some sentences are too long, but you can fix that later, some are run on sentences. I thought it was pretty good for the first draft, especially since you wrote it this morning.” (Week 3, Tuesday)
  - “T4: I thought it worked really well for a very wide audience, especially for a teaching institution; T1: I thought that it came across that you liked teaching; T5: I thought that your love for the profession really came through… not just that you like teaching, but that you really gave some thought about it.. a lot of depth.” (Week 3, Wednesday)
  - “T6: my first impression is that this was well organized.” (Week 3, Wednesday)
  - “T5: I liked this paragraph a lot too.. you laid down your principles in an entire paragraph.” (Week 3, Wednesday)
  - “S7: I didn’t see the sensitivity as a bad thing, it shows that you are developing as a teacher.” (Week 3, Wednesday)
  - “S7: I thought this was pretty polished, my comments are nitpicky.” (Week 3, Wednesday)
  - “T1: I like you talk about specific course materials…” (Week 3, Wednesday)

**Sharing ideas.** The sharing ideas code captures instances where participants exchanged information. The two particularly salient sub-codes capture two aspects of the sharing of ideas: the form in which the ideas are shared and the content of the ideas. Specifically, the “Sharing Ideas—Storytelling” code captured any event in which participants share or exchange information and/or resources through storytelling based on their personal experiences or the experiences of their friends or colleagues. The “Sharing Ideas—Teaching Strategies” code captured any event in which participants share or exchange information and/or resources about teaching practices or strategies. Examples of these codes are shown below:

- **Sharing Ideas—Storytelling:**
  - “S2: one of the selling points of a candidate she knows of is that he put a syllabus in for a course and the recruiting committee was impressed by this. You could include class projects or activities, to show them what the courses would cover.” (Week 3, Tuesday)
  - “T5: I entered the area of teaching with gut instincts then was really reassured that I was not the only person who approached it like that” (Week 3, Wednesday)
  - “S7: It’s tough, in all the classes that I taught, there were 4 girls in the class and 1 dropped, it’s a different dynamic…” (Week 3, Wednesday)
  - “S7: The big assignments came the 3rd week and 5th week and the little assignments weren’t accepted later. Most people are more proactive if they know homework couldn’t be late; S3: I remember doing homework when I was doing field work and had to fax it from a hotel room for twenty dollars.” (Week 3, Wednesday)

- **Sharing Ideas—Teaching Strategy:**
“S4: I’ve seen examples where people give students different options for assignments.” (Week 7, Tuesday)

“S7: The one point about enabling non-traditional students, having flexible deadlines, ... But I think that’s a policy that should be available for everyone. You might want to change the bullet heading. S3: I think we talked last week about family status, we brought it up, you could include a flexible deadline for a sick child or a sick roommate, anyone before a deadline.” (Week 7, Tuesday)

“S3: I picked up on that, too, I saw three paragraphs about mentoring underrepresented groups. You could contribute to diversity by mentoring to a wide variety of groups, participating in programs.” (Week 7, Tuesday)

Stage fright. The stage fright code captured ways in which participants express uncertainty about their writing or work and aired concerns that they had about the quality of their portfolio elements. This included abstract concerns, but also concerns about sharing these items with the intended audience. Examples of this code are shown below:

- Stage Fright
  - “T5: glad that’s out of the way... listening to this is very good to hear... I was concerned about making my statement personal... after looking at it I don’t know how much of it is actually engineering specific...” (Week 3, Wednesday)
  - “S7: Go easy on me here.” (Week 7, Tuesday)

Task negotiation. Participants spent a great deal of time engaged in figuring out what they were supposed to be doing, what they wanted to be doing, and how to go about doing it given the available resources and current conditions. Three codes, in particular, captured seemingly significant aspects of this task negotiation. The “Task Negotiation—Organization” code captured any discussion, comment, or reference in which participants worked on specific structuring and/or organizational activities related to peer review or any other organizational or business details associated with any aspect of the ETPP session. The “Task Negotiation—Feedback” code captured any instance or event in which participants discuss or make decisions about the type of feedback they wish to receive. Finally, the “Task Negotiation—Absent Friends” code captured any discussion or event in which participants present in the current session talk about participants who are absent in the current session. This could be but is not limited to feedback about portfolio elements for participants who are absent. Examples of these task negotiation activities are shown below.

- Task Negotiation—Organization:
  - “S4: Do we have an agenda today? We have limited time. Everyone pulls out the agenda for the day. They start reading through it. S2: So, when do we actually do the reviewing of teaching philosophy statements? People look at the agendas. Maybe it’s included in finishing up last week’s stuff, so maybe we should just do that.” (Week 3, Tuesday)
  - “S3: do you want to break into two groups? I want to read some statements.” (Week 3, Tuesday)
  - “T6: reading through handout about best way to get feedback. Let’s just skip this and go to peer review (laughter)” (Week 3, Tuesday)
“T6: what about the 3 absent people (T3 absent 1 person) gave me hers and then said she would be happy to read others” (Week 3, Wednesday)

“T6: do we want to move on? What is the time” (Week 3, Wednesday)

“T2: I felt it worked best to break up into 2-3 person groups” (Week 7, Wednesday)

• Task Negotiation—Feedback
  “T4: More interested in first impressions for statement” (Week 3, Wednesday)
  “T5: I think I’m just looking for relatively high level feedback… if individual sentences don’t work please let me know…or if it’s not flowing” (Week 7, Wednesday)

• Task Negotiation—Absent Friends
  “T6: what about the 3 absent people (T3 absent 1 person) gave me her’s and then said she would be happy to read others; T1: how about we read ours, we read T3’s if we have time, and then they can be a virtual group of 3 if they need a review. I can’t keep 4 things in my head at once, do we want to each have a turn?” (Week 3, Wednesday)
  “T1: I don’t know what happened with T2 he said he was going to come T3 was just busy.” (Week 3, Wednesday)

Writing. Creation of a portfolio is a writing intensive activity, and thus it is also unsurprising that participant comments focused on the written nature of the activity. Participants spent time discussing writing processes as well as commenting on each other’s writing from the perspective of an editor. For example, the “Writing—Reflection on Writing Processes” code captured any incident or event in which participants discuss their process for how they went about writing a portfolio element. This could include discussions about how they initiated the writing process, and where they got ideas or models for how to begin writing a portfolio element such as a teaching philosophy statement. This category also includes wrestling with what content to include in a portfolio element or how to include it. The “Writing—Editor Review” code captured any incident or event in which a participant receives specific feedback about writing issues such as but not limited to copy editing, organizing content, and grammar. Examples of these writing codes are shown below.

• Writing—Reflection on Writing Processes:
  “T4: limited … to 1.5 hours for her statement since that was the time commitment and that’s all the time that she had… laughter… the test strategy…; T6 I went through this thing for the activities… I picked one on the list I picked role models and teaching as decision making and also the teaching and learning questions. The three categories helped but it was still very difficult; T5: I ended up using the decision making one myself this was helpful; T1: I did something totally different I free wrote everything I could think about with teaching.. I actually had one already but totally scrapped it… T4: why did you scrap it? T1 it was totally disorganized compared with what we had read online.” (Week 3, Wednesday)
  “T5: for me I’m a painfully slow writer. I went through the exercises and they were helpful, then I actually had to start writing. I was uncomfortable about having to lay out my whole incredibly powerful document… an hour later (laughter) once I got away from that, I thought of a teaching statement from last
week that I liked a lot it was like the process of becoming a teacher…” (Week 3, Wednesday)

- “T1: I had a hard time deciding specificity… do you focus on specific group… hard because you don’t want to sit on a pedestal and preach about diversity.” (Week 7, Wednesday)

- Writing—Editor Review:

  - “S3: The weakest paragraph was the first whole paragraph… I was confused by what you meant by making teaching personal.” (Week 3, Tuesday)
  - “T5: I think from the number of decisions that you describe… maybe it would be stronger to adjust the balance a bit and maybe substitute a concrete example to show some of the decisions that you describe.” (Week 3, Wednesday)
  - “S2: I liked that, seeing why diversity is important in engineering. This first paragraph, I don’t know, it doesn’t really, it describes your background but I don’t know how this contributes to your interaction in the classroom.” (Week 7, Tuesday)
  - “T2: equally motivated by da da da… I’m already trying to think of equally as a diversity word… Then you talk about having an equal opportunity… these are word issues…. But you may want to think about this…” (Week 7, Wednesday)

References


