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## Changing Teacher Candidates' Perceptions of Literacy in Content Classes: The Role of Expert-Novice Dialogues

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### Abstract

This manuscript details an exploratory study of an assignment in a literacy across the curriculum course that assisted teacher candidates to recognize the distance between expert and novice readers in their content specific teaching. The study explores how teacher candidates discovered strategies necessary to build comprehension of disciplinebased texts, particularly for novice readers. Data collection included multiple entries from thirty teacher candidate journals that were generated during partnered dialogues. Journals were analyzed for clues as to how teachers can better approach helping students to read varied disciplines' texts with greater comprehension. Findings suggest that by placing teacher candidates in the position of both novice and expert readers, 1) they gained insight into how to scaffold instruction so that students become more expert readers of their content; and 2) they exhibited a willingness to work with these strategies because they empathized with struggling readers.

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## Changing Teacher Candidates' Perceptions of Literacy in Content Classes: The Role of Expert-Novice Dialogues

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### Abstract

*This manuscript details an exploratory study of an assignment in a literacy across the curriculum course that assisted teacher candidates to recognize the distance between expert and novice readers in their content specific teaching. The study explores how teacher candidates discovered strategies necessary to build comprehension of discipline-based texts, particularly for novice readers. Data collection included multiple entries from thirty teacher candidate journals that were generated during partnered dialogues. Journals were analyzed for clues as to how teachers can better approach helping students to read varied disciplines' texts with greater comprehension. Findings suggest that by placing teacher candidates in the position of both novice and expert readers, 1) they gained insight into how to scaffold instruction so that students become more expert readers of their content; and 2) they exhibited a willingness to work with these strategies because they empathized with struggling readers.*

It is the first week of Literacy across the Curriculum, a required course for teacher candidates pursuing a Master of Arts in Teaching. The students do a think-aloud describing what they are imagining as they read a Haitian folktale, *Bouki's Glasses* (Courlander, 1964). Upon finishing, M., fresh from an editor's job with the Yale Review, raises her hand, "Professor, I'm a good reader. I don't need to think while I'm reading. This isn't useful to me." Three weeks later, this same language arts teacher candidate reads from *That Ubiquitous Sum:  $1+2+3=\dots n$* , (Bezuska & Kenney, 2005). Again M. reflects on her reading: "I feel intimidated and inadequate. I'm not stupid-so why can't I understand this?" A teacher candidate, a competent reader, discovers that all readers struggle at times and in the process develops sensitivity to teaching reading in her discipline.

This exploratory study examines an assignment that has visceral impact on teacher candidates, causing many to re-examine teaching students both content and reading skills. It also extends beyond viscerality by aiding teacher candidates to analyze strategies necessary to read in their content area and posit methods to help students gain these strategies. The major premise: We become experts through experience.

### Rationale

All education school instructors of content literacy face the daunting task of convincing everyone from music to math teachers of the efficacy of including literacy scaffolding for readings in their classroom. A major change in teachers' dispositions must transpire. The authors of this paper join with those who see literacy skills in service of deepening conceptual

understanding of a discipline. As Thorndike (1974) declared decades ago, reading is thinking. Recently, Zwiers (2008) when writing of the necessity for focus on academic language added the equally succinct line, “Language *is* content,” (p. 51). Researchers (Langer, 2011; Shanahan & Shanahan, 2008; Snow, Griffin & Burns, 2005) now argue that clarifying what makes reading of a particular discipline unique helps teachers to understand the importance of the task.

The authors have promoted content literacy with secondary teacher candidates, experimenting with methods to demonstrate that they “are in a strategic position to influence adolescents' uses of literacy for academic learning” (Vacca, 1998, p. 30) and that literacy contributes to disciplinary learning. This exploratory study of an assignment placing students in the role of both expert and novice readers of disciplinary content caused teacher candidates to rethink their responsibilities as content specialists.

### Literature Review

Braunger, Evans, and Galguera (2005) encourage approaching content teachers in a new way: “They must understand reading as a developmental process in which the knowledge and strategies needed to comprehend more sophisticated subject area texts develop, with appropriate support, in the process of extensive engagement with such texts” (p. 12). The authors go on to argue: “Teachers must be knowledgeable about all of their students’ content area literacy strengths and needs, about the demands of particular texts, and about the support necessary for particular students to learn from them” (p. 13).

Why is it important for teachers to move beyond understanding their content to understanding how students read their disciplines’ text? How does an expert read history or physics or algebraic story problems? Is it significantly different from how a novice reads that material? The research of Bransford, Brown, and Cocking (2000) suggests that across many disciplines, experts approach tasks differently from novices, “Experts have acquired extensive knowledge that affects what they notice and how they organize, represent, and interpret information in their environment. This, in turn, affects their abilities to remember, reason, and solve problems” (p.19). Other researchers (Shulman, 1987; Nathan & Petrosino, 2003) go a step further, suggesting that experts lose sight of how novices learn subjects. They suggest that understanding one’s discipline is a necessary, but insufficient prerequisite to teaching novices. They insist that pedagogical knowledge is equally important to subject matter knowledge. In examining teachers of chess, math, and history, Nathan and Petrosino suggest an “expert blind spot” that keeps experts from remembering their approach to their discipline when they were novices. Braunger et al. (2005) go further, suggesting that expertise can actually be an obstacle to teaching. Unable to remember early experiences with disciplinary text, experts often ask students to approach text in a sophisticated manner for which many are unprepared.

A salient aspect of learning any discipline is the ability to read and interpret works from that discipline. Wineburg (1998) contrasts the reading of primary documents from the Civil War by an historian with a strong general background in history with one considered an expert on the war. He finds that what allows the non-expert to read well is: “His way of asking questions, of reserving judgment, of monitoring affective responses and revisiting earlier assessments, his ability to stick with confusion long enough to let an interpretation emerge” (p. 340). He suggests: “It may be the students’ response in the face of complexity—what they do know when they *don’t* know—which holds the key to their continued learning from the world we call the past” (p. 340).

Greenleaf, Schoenbach, Cziko, & Mueller (2001) research a ninth grade “academic

literacy” class in which students approach texts with a metacognitive eye, willing to grapple with texts they would have once found boring and inaccessible. Through a case study, these researchers demonstrate that a young reader taught to be cognizant of her reading difficulties can mediate incomprehension, building, moment by moment, a stronger understanding of a history textbook passage. Continued work over the past decade (Schoenbach & Greenleaf, 2009; Langer, 2011; Shanahan & Shanahan 2008; Snow, Griffin, & Burns 2005) has explored the unique aspects of texts in science, history, literature, and mathematics, studying also how students interact with them. Snow and Moje (2010) note content-specific literacy courses cropping up in teacher education programs. Draper (2008) after interacting with teachers in music, theater, and mathematics, recommends that literacy instructors “push in” to discipline-specific methods courses. The authors will argue for the efficacy of teachers of varied disciplines continuing to interact through activities like expert-novice dialogues.

### **Research Design**

The purpose of this “exploratory study” was to investigate the effects of an assignment on teacher candidates’ sensitivity to difficulties in content texts and willingness to consider strategies that might mitigate these difficulties. Exploratory research is a viable way for teachers and instructors to investigate something that interests or puzzles them in their own classrooms, because the research is integrated into their day-to-day teaching (Allwright, 1993). The authors used Allwright’s exploratory study framework as the research design for this study using qualitative methodology. The authors extended Allwright’s sixth step by conducting a formal data analysis. The following steps were conducted:

- 1) An area of interest was identified;
- 2) The area of interest was refined through reflection;
- 3) A specific topic was chosen as a focus;
- 4) A course assignment was used as an exploratory research tool;
- 5) The assignment was carried out in its entirety;
- 6) Outcomes of the assignment were analyzed and interpreted; and
- 7) Implications for future instruction were identified.

### **Area of Interest**

A decade ago two Title 1 teachers, one of whom is an author of this paper, organized a workshop for reading and math teachers. They started with the assumption that teachers read differently from lay readers when approaching their discipline. Both reading and math teachers read math problems from a state achievement test. All wrote down their thinking while solving the problems. The ensuing discussion proved fruitful as one of the math teachers said, “This is simple. I look for the function, throw out all extraneous words, then solve the problem. This question was a ratio problem. That’s all I needed to know.” Conversely, English teachers found themselves perseverating on the connective “and,” wondering whether it meant plus or whether it was delineating a sequence of actions. The ambiguity created difficulty in deciding how to solve the problem. This productive foray into dialogue between teachers of differing disciplines provided a model for better understanding differences between novices and experts.

## **Focusing the Research Topic**

When reading Braunger et al. (2005), the Title 1 teacher turned professor, was reminded of a potentially efficacious teaching strategy. He decided to explore whether placing teacher candidates in the position of both expert in their own field and novice in another would help them become better at scaffolding text so that students could approach reading with greater confidence.

## **Research Tool**

The focus of this exploratory study was on the following assignment, created to explore novice/expert differences. The multifaceted assignment involved the following steps:

1. Students paired with a partner from a disparate discipline. For example, language arts and social studies teachers were coupled with science or math teachers.
2. Students searched for articles of fifteen to thirty pages, from discipline-related materials that they read to increase their disciplinary knowledge.
3. Each student created a journal in which she recorded reflections on the process. The first entry discussed why the student chose the selection.
4. One article from each interdisciplinary pair was read each week, each partner “thinking aloud” through marginalia or journal notes.
5. During each class session, before dialoguing with partners, individuals read their own, and their partner’s, marginalia, reflecting in writing on how they read differently.
6. Pairs read one another’s reflections, then conversed about their contrasting strategies.
7. Students wrote a reflection on what they learned about the particularities of their disciplines’ texts, strategies to employ to read their discipline with better understanding, and ways to bridge the gap between novice and expert in each content area.

## **Researchers’ Roles**

In a qualitative study, the researcher is the primary instrument used to collect data (Merriam, 1988). Both authors are currently professors in a School of Education at a private university. The first author was the professor of the course that was the focus of this exploratory study. He regularly teaches literacy courses at the university and has over thirty years experience as a reading teacher in grades 9-12. The second author has over five years experience teaching content-area reading courses to undergraduates and graduates. She also has conducted longitudinal qualitative research studies over the past twelve years. The first author invited the second author to assist with data analysis and interpretation.

## **Data Collection**

Course members’ journals were the primary source of data collected for this exploratory study. One of the authors, the professor of the course, collected the journals at the end of the summer 2006 session after grades had been assigned. Course members participated in every aspect of the assignment described above without knowing about the study. However, after

grades had been assigned, all course members were contacted and gave the professor permission to use their journals in this study. Permission from the university's Human Subjects Committee was granted to conduct this research. In order to preserve the anonymity of all participants, all names in this study are pseudonyms.

Thirty journals were collected from fifteen dialoguing pairs. Within the fifteen duos, there were four math/language arts pairings, three social studies/math, three science/ language arts, one social studies/science, one foreign language/science, one music/language arts, one social studies/language arts and one health/social studies. Therefore, 30 teacher candidates participated in this study. All of the teacher candidates were taking the course, Literacy Across the Curriculum, required for the Masters of Arts in Teaching (MAT) in the School of Education at a private university. The university is located in a metro area in the northwest and serves approximately 3000 students.

### **Data Analysis**

In this exploratory study, the authors made an effort to reduce data and synthesize them for interpretation (Creswell, 1994). Qualitative data analysis is grounded in the data collected; interpretations are built out of what is seen in the data, allowing themes to evolve as data are analyzed. The researchers followed steps outlined in Merriam (1988). They began by analyzing students' insights by reading through each pair's set of journals. Both researchers read through the same students' journals at the same time. While reading the journals, they took notes on thoughts that students' comments triggered, these sometimes being the students' own insights. After reading each set of journals, the researchers shared findings through conversations. Through these conversations they expanded on original notes and began to make connections to theories in the reading education literature. They added these insights to their written notes. The analysis proceeded in this manner with each of the fifteen duos' journals.

After that process was completed the researchers conducted a more intensive data analysis using Merriam's framework (1988). The steps carried out are summarized below:

1. Word-processed the hand-written notes and comments written in the margins of the journals.
2. Read through the word processed notes and comments and grouped those that seemed to go together. This constitutes a classification system reflecting recurring patterns.
3. Took the reoccurring patterns and turned them into categories for sorting the data. Categories reflected what we saw in the data.
4. Cut units of information (the data) and coded them with the categories. Units of information bearing the same category placed in file folders.
5. Developed descriptions of each category.
6. Linked categories to develop hypotheses.
7. Integrated and refined categories and hypotheses to develop theories.

### **Results**

As journals were read and themes emerged, the authors noted interesting patterns of response. When novices read their partners' material, they were often taken out of their comfort level. This was not only a revelation to them, but also, often, to their partners. This discomfited reaction frequently engendered an empathetic reaction from one or both of the partners. From

this discovery of unexpected difficulty emanated comments positing potential strategies to make readings more accessible to students. As the authors attempted to categorize student commentary, they found that some followed the following stages: 1) recognition of the novice's difficulty; 2) empathy for both the partner and for students who might also demonstrate similar patterns, then 3) a plan for methods that might mediate these difficulties. Students not only noticed difficulty, but immediately began thinking about how to teach in a manner that would help students read their discipline. The following themes were identified

### Recognition of Difficulty

Most teacher candidates chose their articles with their audience in mind. Over and over the first piece they selected was one they expected to be accessible to their partner. The following comments reveal the teacher candidates' effort to provide an interesting selection:

- *I was not sure about how well T. could read scientific articles, but he was interested in autism so I decided to focus the first reading in this area.*
- *I chose selections that I hope will dispel the general perception that history is about boring facts, memorizing dates, and dead people.*

The next set of reflections demonstrates that teacher candidates thought out their texts in terms of difficulty level:

- *I chose a chapter on jazz from a music text book which would be geared for a high school music appreciation class. I wanted to give M. something that wouldn't scare her like the inner workings of modulations through augmented sixth chords.*
- *I chose a really good book about cosmology written for a general audience. I especially appreciated the light-hearted humor that the author brought to some pretty complicated discussions.*

These responses demonstrate a concern for finding accessible materials for an untutored reader. They also show a situational recognition of differences between novices and experts in the ability to appreciate and/or gain meaning from reading in particular disciplines. In this aspect of responding to the assignment, teacher candidate experts demonstrated they were not "blind" to differences.

Ironically, however, the expert's perception of accessible text was not often confirmed in novices' actual reading. While K. thought her partner's interest in autism would mitigate difficulty, her partner fell apart quickly in his reading. In another example, one novice found:

*I struggled with the economic text unable to get past the initial paragraph without being lost in a sea of bewilderingly unfamiliar vocabulary. D. was shocked—he took it for granted and had no trouble understanding... Often some of the things he found most interesting, simple, or useful were completely lost on me.*

Novices found that their comprehension was more concrete. A language arts candidate felt lost when reading a science selection: "After reading the article, I found that I could get through the article getting only the gist of what Fisher was proposing. I could vaguely recall many of the formulas that he included."

The biggest obstacles to comprehension were unknown terminology and too many new concepts presented at once. After reading her partner's business article, one science teacher candidate noted: "I struggled immensely with D's text, unable to get past the initial paragraph without being lost in a sea of bewilderingly unfamiliar vocabulary."

A language arts candidate revealed his increasing disinterest while reading a technical



article:

*I did find that I really struggled with it though. I found it very interesting in the beginning, learning about the different diseases and how they get transferred, but then it started to lose me. The statistics, which at first were great, started getting more and more dull. The reading also started getting more technical. I found that I really had to pay attention to what I was reading. That started not working as well, so I had to re-read almost every other paragraph. I finally started getting a little frustrated and ready to move on, so I skimmed the last couple of pages.*

Novices reported confusion, frustration and disengagement while reading experts' texts. They attributed these emotions to "information overload" and lack of knowledge about the field. Though many teacher candidates thought they were choosing accessible articles, their partners suggested areas in which they struggled.

### **Experts Decipher Differences in Comprehension**

Experts found not only a sense of frustration among novices, but also that novices read with less attention to what was salient to them. They noticed that they made more connections to the text and that these connections allowed them to see a more global picture. One teacher candidate reflected:

*L. and I asked very different questions. I attributed this to the fact that I am an experienced reader of historical texts. I have a large volume of background knowledge and am able to search for broader meaning and purpose because I know a fair amount about the Apacheria and military campaigns.*

Another history teacher candidate suggested: "The expert reader will be able to read material and scaffold to concepts more abstractly than a novice reader. From a historical perspective, the expert reader will identify trends and apply them to future events."

A third claimed that this abstracted reading of social sciences was a main difference in the way he and his partner read his article:

*I found myself making larger connections to global policy. I was trying to ask why and how. Having background knowledge of this style of essay, I knew to sift through facts for larger meaning. What is the state of global policy? I asked myself this continuously.*

In contrast, the novice paired with this candidate fought to make connections: "After sharing our response journals, it was clear we approached the reading very differently. Struggling to stay involved with the text, I stretched to link experiences with anything I could."

Experts repeatedly mentioned that they made connections to their disciplines, especially to background knowledge. They claimed that the connections made were more in-depth than those of novices. This finding fits Braunger et al.'s (2005) description of experts. The authors explain that it is not only the knowing of information that defines experts, but also how they retrieve specific information necessary for a given task. This conditional knowledge, or knowing when, where and why to use knowledge, is required to retrieve specific knowledge needed to achieve a task successfully. On the other hand, novices' made peripheral personal connections because no discipline-specific connections could be made. This added to comprehension difficulty.

## Empathy

As seen above, teacher candidates' choices in articles for their partners revealed an inchoate sensitivity towards their partners and a desire to build interest in their content areas that was not always efficacious in terms of helping novices' comprehension. However, novices' incertitude often built experts' appreciation of the difficulties that novice readers might encounter in classrooms.

The authors agree with the view that the concept of empathy is "the primary mode of human connectedness" (Courtright, Mackey, & Packard, 2005, p. 126). Nieto (2006) suggests that characteristics of effective teachers include empathy for their students. Of further interest is research that shows that college students develop higher levels of thinking as they progress through college and that this higher level of cognitive development contributes to an increased ability to feel empathy (Benack, 1988). The hope for the partnered dialoguing was that empathy for novice's difficulties would hook into this developmentally appropriate growth in empathetic response.

Empathy has been seen as both cognitive and affective. Piaget (1965) suggested that in the cognitive process, one assumes the role of another through an understanding of his or her thoughts, feelings, and actions. Affective or emotional empathy involves an emotional response to others' emotional responses (Stotland, 1969). What the authors have seen in the data is a combining of cognitive and affective responses, made more complex because, instead of just feeling someone else's pain and relating it to their own, some of our candidates felt their own pain as they read unfamiliar text and related it to the possible experiences of readers of their own discipline. Here two novices reading math texts not only notice their own struggles, but think about what their future students might feel:

- *The word theorem on page one has already begun to worry me, and I can sense how a student would feel if he was directed by his or her teacher to read something unfamiliar and intimidating (such as I feel with anything having to do with math).*
- *So reading the math article really made me feel that uncomfortable feeling of 'Uh...I didn't get it.' Some of my students will probably feel that way at some point in my classes. So this activity raised my awareness of how my students will be learning and hopefully fixing their struggling reading.*

Experts developed empathy after learning how their partners struggled with their texts. These empathic feelings were often followed with references to future teaching:

*A key realization for me was L.'s emotional response to ratios. She said that she had a negative reaction and perhaps this is due to a fairly complex concept written in an unconventional form in a small amount of space. Having L. share this will help me to be more sensitive with my students.*

For certain teacher candidates, the gap between novices and experts elicited understanding of novices' feelings about reading difficult material:

*After our discussion I was enlightened as to how differently a novice and an expert read text. As I was reading and making connections, I was thinking that if I didn't have my background knowledge I would not have been thinking beyond the text in terms of mathematics. If reading is like swimming, the novice has bricks tied to her feet whereas the expert has flotation devices. Thus, a novice can feel overwhelmed and drown in the material whereas the expert is able to enjoy the water and easily float along.*

It appears that experts saw readings in their disciplines in a new light as they

contemplated their texts with an eye towards the novice reader who had realized limitations to comprehension. Teacher candidates acknowledged that readers with less background knowledge may interpret text differently, losing essential comprehension. Both experts and novices found empathy for untutored readers approaching their disciplines' text. Texts need to be accessible and relevant to a novice reader and, as seen in the following section, teacher candidates began to think of strategies to help novices approach difficult text.

### **From Empathy to Positing Strategies**

Empathy is a worthy emotion. However, only through re-adjusting practice can a teacher create changes necessary to help students move from floundering to understanding. Teachers must modify their pedagogy. This recognition that expertise is a necessary, but insufficient quality to teach one's discipline can be the catalyst for bridging novices to increasing expertise. In this study, teacher candidates posited strategies to help students gain understanding of their discipline's texts. After difficulty reading out of her discipline, one English teacher candidate expressed that a teacher was to students' learning:

*This exercise showed me how influential a teacher can be in generating interest for the students while reading something they normally would not. Had this piece been given to me with a foreword or some sort of hook, I could have read with enjoyment.*

A math teacher candidate perplexed by a history text suggested that modeling how to act as an expert reader in a discipline could provide important entry points into how to read in that discipline:

*The expert needs to model both by words and deeds either math and/or history. The expert needs to have an analogy that the novice can relate to as to why the expert approaches the text in the manner he does. By talking with behavior and words, that is to practice what the experts preach, the text reading can apply across a spectrum of situations and relationships. What is essential in the disciplines of math and history is to focus on the when, where, how and what the expert reads. Then the novice can copy or simulate what the expert did to increase his comprehension.*

The dialogue between expert and novice also seemed to broaden both's views of possible interventions:

*From reading this article and discussing it with S., I learned a few lessons that apply towards my career as a teacher. I should choose articles that only teach one or two new concepts. This article included too many equations, so I never got a good grasp on one of them.*

Her partner found that she needed to pay closer attention to how to help students parse central concepts from readings:

*I realized that my process of reading was not an authentic version of what I do when I'm reading to pull out significant science information. The purpose was entirely different... This ultimately is what I took from this discussion to apply to my teaching. I need to make sure to teach my students what the important parts are and how to find them.*

Overall, experts became aware that they need to read the text before assigning it to their students. They noted that their disciplines may be less engaging to others and that this may cause distractions while reading. They also noted a wide variety of strategies to mediate problems in the readings.

## From Recognition to Empathy and Thinking Strategically: A Case Example

As the authors read journal entries, they found numbers of teacher candidates whose narratives moved from recognition of difficulty to empathy to speculation about methods to help students' reading comprehension. D.'s journal was a particularly enlightening narrative. D.'s musings took place after reading his partner's reflections and discussing with her the differences in how they read both their selections. From the very beginning, D. was an empathetic teacher, intending to find a friendly article for his partner: "When I picked out my text selection for business content, I thought that it would be an easy read for J."

Yet, his reflection continues, noting the fallacy of his original premise:

*I learned that I was incorrect. To my surprise, J. found the reading difficult. In particular, she had trouble with understanding the vocabulary. As a teacher, I really should pay attention to the fact that even though I know my content well, someone else may not. I should not assume that the terminology that is so familiar to me will be easily deciphered by my students. Therefore, I have to be especially careful when I select text materials.*

Here we see both empathy and the beginnings of grappling with how D. will adjust his teaching to make the reading more accessible. In a later journal entry, D. once again reflects on the text, noting how its organization is foreign to his partner:

*J. felt that many concepts in the text were unexplained, and thus confusing. J. had trouble understanding the charts and tables. She even skipped over reading some of the tables. Again, I misjudged the text. I thought that since she was a numbers person, she would understand the graphs and charts quite easily. She complained that the graphs and charts were not organized well and display items were not placed in alphabetical order.*

Speaking for both himself and his partner., D. describes possible strategies to respond to this novice's difficulty with the reading, moving from pre-teaching vocabulary to providing a limited purpose for the reading. Understanding the novice's dilemma leads to new instructional decisions:

*We both agreed that it would be helpful for me as a teacher to provide a list of vocabulary words prior to students reading the text selection. In addition, I should show readers how to find parts in the chapter where new terminology would be defined. We also thought that it would be a good idea to inform students about which information was relevant.*

While D. had been confident in his reading of economics, missing that which would cause difficulty for those unpracticed in his discipline, he found himself awash in his partner's physics text. Through this experience, he began to posit what separates experts from novices:

*After discussing my thought with my partner, J., about reading the chapter called Describing Motion: Kinematics in One Dimension in the physics textbook, I learned several things. J. enjoyed some of the problems offered in the text, whereas I dreaded most of them. She was able to take the examples a step further and think of applications to the problem, but I struggled with the basics of solving the problems. Likewise, J. would ask questions in her head and was able to make good guesses about answers to problems presented in the text. Since J. is an expert in physics, the content material was meaningful to her, and she was able to make a personal connection to the examples and concepts provided in the chapter. She does not memorize formulas, but instead relies on derivations of them. Quite the opposite, I tried to remember and comprehend each*

*formula and was confused every time the text introduced a variation of the original formula.*

This understanding of, maybe even empathy for, both expert and novice leads D. to suggest even another technique for making the reading more concrete and accessible:

*I think a teacher could make physics fun if he or she provided practical applications outside the textbook. For example, I am a whitewater rafting guide, and I have to use laws of physics to pull heavy rafts off of rocks in the river when they become stuck. We use ropes to extract stuck rafts, and one must know the appropriate angles in which to pull. Instead of providing physics examples that I could readily employ, the textbook chapter that I read was rather dry and boring.*

As D. sums up what he learned from the expert/novice dialogues, he demonstrates a change in attitude about his responsibility to pre-determine what might be difficult to understand in an academic reading and takes responsibility for scaffolding readings for students. He will no longer blithely assume that a reading will be easy for a student as he did when he first presented J. with an article. He is now committed to being a literacy teacher in his discipline:

*This assignment makes me aware that I must make sure that students are able to understand the content material in my subject area, and the text I provide should be interesting. Furthermore, since I was trying to comprehend everything in the textbook chapter, it would be helpful for students if I informed them about what they should pay attention to and what they can ignore. Also, it would be helpful to provide them with reading tips for my subject area.*

## Conclusions

The expert-novice dialogues brought forward two important findings: 1) teacher candidates began to posit strategies to aid their colleagues in comprehension of their texts; and 2) by experiencing someone who was struggling with their discipline's text, and/or by struggling with another disciplines text themselves, teacher candidates became more willing to work with these strategies.

There were many strategies discussed in journals. These fell into the following categories:

- Establishing a purpose for reading
- Relating text to the reader's interests
- Adapting the original text to make it more accessible to the reader
- Providing background information
- The importance of visuals

Both novices' and experts' notes revealed patterns of how to assist future students with reading in their respective disciplines. As future teachers, they realized the need to make personal connections to their students' background knowledge, to point out important information to students before they read, to model how to read the text, and to utilize a variety of visuals to increase comprehension. The authors are currently following-up with course members through interviews to determine how they have incorporated comprehension strategies into their practice.

This study also suggests that teacher candidates developed a positive disposition towards incorporating literacy strategies into their classrooms Braunger et al. (2005) speak of a change in the stance of teachers who grapple with difficulty in text. They move from seeing themselves as experts to "accomplished novices," recognizing the need to employ strategies when texts get

difficult. In this study, the recognition of difficulty led teacher candidates to act as accomplished novices. Because they experienced difficulty first hand, they empathized with novices reading their discipline's text. From empathy came a commitment to aid students to approach difficult text successfully.

It is critical for instructors of content area literacy courses not only to present reading strategies to their students, but also to show their students why they are important. Through the expert-novice dialogue, teacher candidates experienced that which students are likely to experience in reading history, chemistry, or algebra texts. This partnered inquiry raised the consciousness of teacher candidates about general strategies to employ as they aid students to read texts in their discipline. This deeper understanding of strategies was reinforced by teacher candidates grappling with difficulty when reading outside their discipline. The visceral frustration that many experienced reinforced the importance of understanding where students are struggling, then creating pathways to making texts meaningful. The dialogues built bridges to empathy and closer attention to what novices need to grow as readers.

When teacher candidates graduate from an institution ready to incorporate literacy skills into their teaching, students are well-served. As one teacher candidate commented: "Honestly, I really liked this assignment. It's one thing to say, 'Kids who don't read literature well, really struggle like this.' It's a totally different thing to experience it."

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