

A case study of adjustment:

Looking at a graduate teaching assistant's struggles

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Abstract

This paper seeks to provide further evidence of the problems graduate students face as they are teaching. In order to accomplish this, this study presents a singular case study of the graduate teaching instructor of Mr. M culled from an on-going investigation of the struggles graduate teaching assistants face when front-line instructors. Drawing upon a multitude of data sources such as daily journal entries, a hour-long interview, quizzes, tests, and copies of student work and reactions, the data revealed that Mr. M. experienced conflict in reference to: (1) constructing a non-threatening classroom versus losing control; (2) Wanting students to ask questions versus answering “dumb” questions; (3) Wanting an open classroom versus students talking out of turn; (4) Teaching toward the bottom of the class versus boring the top; (5) Ensuring students do homework versus not enough time to grade; (6) The responsibilities of teaching versus the requirements of being a student; (7) The lecture style versus active learning; and (8) Implementing “difficult” quizzes to motivate students versus assessing to give a grade. Each of these conflicts reveals and repeats themselves at various times throughout his journal entries.

Beyond struggles that posed conflict for Mr. M. in terms of choices that he needed to make during instruction, a variety of problematic scenarios arose as part of teaching the course. In particular, five specific scenarios influenced Mr. M as he was teaching and included: (1) Being accused by a student of telling, during a test, the student an answer was correct when it was not correct; (2) Belief that two brothers were cheating off each other; (3) Student wearing a t-shirt advertising his homosexuality; (4) Being accused of not informing students that they needed to check their work when solving radical equations; and (5) Watching students give up on the course and fail multiple times. Each of these situations greatly disturbed Mr. M and caused him to question his beliefs as a teacher and the interaction of his own moral character. This paper provides further evidence of the problems graduate students face as they are teaching and pose recommendations for the correction of the problems.

A case study of adjustment:

Looking at a graduate teaching assistant's struggles

Teaching assistants (TAs) have become an integral part of academic life at the collegiate level. Since TAs teach a significant share of introductory and developmental courses at research universities, the orientation programs that TAs have both to prepare them to enter the classroom initially and also faculty preparation programs to help them anticipate their role as a future faculty member have come under scrutiny (Adams, 2002; Gaff & Lambert, 1996; Lambert & Tice, 1993; Pruitt, 1997; Pruitt-Logan, Gaff & Jentoft, 2002; Tice, 1997). As the focus has settled upon pursuing excellence in higher education and the quality of undergraduate education, the training of TAs to handle complex classroom situations becomes of greater importance to educational leaders (Meacham, 2002; Tice, 1997). Bender (2004) encapsulated this perspective in the following way:

Whether they want to be or not, TAs are important role models for undergraduates and often serve as influential mentors for the students in their classes. TAs make a significant difference in the lives of undergraduates. An enthusiastic and committed graduate student can help to transform an undergraduate student not only into a major in the field but into a potential graduate student. The reverse is also true: when graduate students fail in their teaching duties, undergraduate learning suffers. A disorganized, ill prepared, and ineffective classroom instructor can undermine the hopes of even the most dedicated undergraduate to pursue the discipline in future semesters” (p. 267).

The question that naturally arises is how does a novice TA grow into becoming a better teacher? Shannon, Twale, and Moore (1998) claim that “TA training should make further use of the case-

based instruction, in which realistic cases are presented and possible solutions are discussed by students” (p. 458). In addition, Patterson and Fleet (1996) identify that within teacher education programs, stories of professional practice are a powerful tool for developing understanding and critical thinking.

But where does one obtain such case stories? Clearly, there is a need for research focused directly on issues faced by TAs in the collegiate mathematics classroom in order to build cases useful for reflection during TA training sessions. In fact, both the Boyer Commission on Educating Undergraduates in the Research University (1998) and Langenberg (1998) called for research that clearly identified the issues facing graduate students and the effects graduate students have in the classroom. It is the goal of this paper to provide further evidence of the problems graduate students face as they teach and pose recommendations for their correction. Only by adding to the growing body of research looking at the challenges graduate students face can one hope to identify potential methodologies which smooth the transition from undergraduate student to graduate teaching assistant. In particular, this paper sought to address the question of what are the various pedagogical, emotional, and mental struggles encountered by graduate teaching assistants as they teach mathematics and what examples could be drawn from them? To answer this question, the paper identified struggles faced by a particular TA and connected these with discussions of coping mechanisms.

Methodology

This study presents a singular case study of a graduate teaching instructor, Mr. K., culled from an on-going investigation of the struggles graduate teaching assistants face as front-line instructors. Rather than acting as a recitation leader for a large lecture class, the graduate

teaching assistant under investigation taught a precalculus class (Math 120 - College Algebra) of nearly 30 students coordinated by a faculty member. Coordination dictated the summative assessments but the graduate teaching assistant personalized in-class assignments, assessments, and teaching style. As a result, this study's implications, although mitigated by the psychological, philosophical, and pedagogical beliefs of the graduate teaching assistant, allow one to point to various issues that emerge from the pieces of data gathered.

The focus of the case study

The case of Mr. K. was selected from a larger investigation focused on the struggles graduate students face when teaching a precalculus mathematics course. He was selected because he typified the experiences of many of his colleagues: (a) had no teaching experience, (b) had a significant other which amplified the separation between his responsibilities to the university and to other external commitments, and (c) had no intention of a career in professional teaching. In fact, he pursued a degree that eventually took him to a position in the business community. In these ways, Mr. K. was typical of a large portion of graduate teaching assistants supported by Department of Mathematics and Statistics at this regional state university. The case study of Mr. K. permitted this discussion to focus on one student who experienced many of the same problems faced by the set of graduate students under investigation. Utilizing this methodology, the study provided a consistent look at a single graduate student's struggles rather than consistently having to provide background to situate each graduate student's commentary.

Data sources

In support of this research, the study drew from a multitude of sources such as classroom observations, daily journal entries, an hour-long interview, quizzes, tests, and copies of student work to clearly delineate the issues faced by this graduate teaching assistant. One should note that this graduate student received one week of instruction prior to entering the classroom and took a Stephen Rodi inspired semester-long sequence of seminars entitled “Professional Aspects of Teaching”. As part of week-long university training, Mr. K. heard discussions primarily concerned with university policies and procedures although a few presentations dealt with ethics in the classroom, handling cheating, etc. presented by various members of the department and the university. The semester-long departmental seminars attempted to model good teaching without necessarily addressing topics like how to deal with students that are disruptive, suspected of cheating, or talking out during lectures. In addition, the course did not address methods to get students involved and motivate them to do their homework every night. Other sessions concerning various aspects of general teaching practices, sponsored by the Graduate College Professional development program, were available but seldom attended by Mr. K. For the most part, the instruction and seminars were one-way dialogues which did not permit much interactive discussion of the issues TAs were facing in the classroom.

Data analysis

In support of this study, open and coaxial coding was used to identify the emergent data correspondent to the various struggles this particular graduate teaching assistant faced as evidenced in his journals. The interview helped clarify the origins of these struggles and identify the steps taken to resolve or accept them. The use of such a qualitative research methodology

allowed the research to blend an investigation of a contemporary phenomenon within its real-life context while weaving multiple sources of evidence. These qualities conform to descriptions by Yin (1988) and Merriam (1988) who describe a case study as an intensive description of a solitary instance or phenomenon for the purpose of drawing interpretations within the context of the data collection. As a result, the chosen methodology of a case study satisfied the essential properties of being *pluralistic* (focusing on a particular event, situation, or phenomenon of interest), *descriptive* (producing a rich, thick description of the phenomenon of interest), *heuristic* (illuminating the reader's understanding of the phenomenon of interest), and *inductive* (identifying new relationships, concepts and understanding). Such a blend of data collection and analysis techniques allowed this research study to delve into the intricate origins of the struggles that Mr. K. faced as a graduate teaching assistant and permitted the study to explain the “what”, “how”, and “why” by using the quotes and samples in order to document and characterize the events.

Background

Before examining the problems and issues Mr. K. faced and the tacks he employed to address them, one needs to gain a vision of the philosophical point of view held by Mr. K. concerning his role as a teacher and the students' roles. Only by carefully examining these positions will one be able to situate the choices and perspectives held by Mr. K. and how his students perceived them that semester.

Mr. K's philosophy

Mr. K. considered the course to be one, which separated those who should be in college from those who should not be. In fact, he stated the following during the interview:

As much as you would probably deny this, but and probably all the other people in the math department would also, but I, I think that some students can't do math 120, this is a separator course. The students that can't do that are not going to go on to do anything else. They are the ones that go on to a technical college and just learn a trade or go and work in a factory back at home. And, and that's not a bad thing. Hey, some people are not cut out for college. I mean that I think that this is a separator course for people.

This separation aspect did not mean that Mr. K. did not care for his students. For instance in the middle of the semester Mr. K. wrote in his journal: "I am planning on giving a quiz tomorrow that covers sections 3.4-4.1. I think it will be difficult for the students because they really don't want to be studying tonight." Then, in the next day's entry, he stated, "After grading the quizzes that my class took this morning, I am once again left questioning my worth as a teacher. The class average was 54%. Absolutely pathetic. The most upsetting thing for me is that the quiz was comprised of homework problems with numbers changed. I guess that I shouldn't be upset with my students but I can't really help it. I guess that I care for them. Sounds corny but that's the way it is." Evidence of caring was not restricted to this single instance. Another place where his care became evident was in the following statement "I just want to help them gain as much understanding as I possibly can and if that's through challenging them through quizzes or whatever, that's what I want to do. If I didn't do that I think I was selling them short. If I just went in there and said OK do whatever. I don't care what you do. I just want to get out as quickly as possible. I mean that's, that's a cop out. That's not doing my job." However, Mr. K's

caring did come with a dose of reality. He recognized that he could only help the students who wished to be helped and this was exquisitely clear in a statement he made during the interview.

I found that I can only, I can only preach to my students so much, I can only say that this is what you need to be doing and after that its just they tune me out, they don't care and so, I may, I may say it once, I may say it twice, but that's about it. I just, I've learned a lot of patience this semester in dealing with students. I just got to they are going to do what they are going to do, all I can do is go in there and just do the best I can every day and if, if I can, if they are not willing to learn, I'm still going to do the best I can but it annoys me to no end.

This preaching included how the students should study, that they should keep up with the homework, and pay attention during class. In essence, Mr. K. considered it incumbent on the students that they should take pride in their work and strive to do their best.

The last element, which helps situate Mr. K's perspectives, involves his discussion of how he presented the mathematical material and what he expected students to gain from that presentation. When asked about the reasons behind the statement "I think I grew more as a teacher last semester than any other time", Mr. K. responded with:

Instead of going just through and saying here's the rule of how to solve this equation, or here are the steps to solve this problem. I kind of had the students look at it from a wider point of view and say O.K. Let's think about this problem, what are we being asked to do here. O.K, and then instead of giving them a step by step approach, I kind of asked them to look at a problem from a wider point of view. Let's see how this compares with what we already learned and go from there.... I just, I felt that the students would, would enjoy the class more if I said OK here's how this problem relates to this, and tried to

relate some of the things we were doing in class to maybe real world type problems where they may think gosh this has absolutely nothing to do with real life type stuff.

Where I feel like it does. Maybe not everything but ... I really think that students kind of resist at first, they just want the rules for a problem, but if you, but once they get used to saying O.K. I'm doing more thinking now than just memorization. I think that they gain more.... you have to teach them some sort of structure but also give them also the wider picture of O.K. maybe here's why we are doing this, here's how you want to learn this, instead of saying just well here's the right answer how ever you arrived at it.

From the perspective of Mr. K., the structure was provided to serve as a means of organizing the material and helping the students to situate it in their minds. He wanted the course to help the students draw connections between the content and real-world applications as well as to provide his students with a structured view of mathematics. For instance, Mr. K., when explaining the difference between his teaching philosophy and those held by many of his colleagues, stated:

... suppose you had a radical and it was f of x equals the square root of like x squared minus $3x$ plus 2 . You want to find the domain of that. Well, I teach my students a little bit differently. Where you factor under the radical, and then well the number under the radical has to be positive or zero, so how do you multiply two things and get a positive or zero. Well, both are positive, both are negative, and I don't know, I thought this was interesting. Most of the other graduate students looked at me, they thought it was odd that I taught it that way because they, it was the hard way. I thought, no, no, this is not the hard way it makes ... it makes them think about OK what do I have? This number has to be positive, how do I get two positive numbers? Things that are just, are just trivial

just a little bit, like just one step at a time but if you compile a bunch of trivial items then I guess it's hard.

In essence, Mr. K. strove to give insight rather than merely identifying a “laundry list” of steps to the answer but not necessarily understand how the process arrives at the answer.

These philosophical beliefs were evidenced in the way that Mr. K. interacted with his students, taught his class, and designed the classroom assessments. In general, he employed fairly traditional instructional techniques with him taking on the role of the “Sage on stage”. He typically placed himself at the front of the room; chalk in hand, lecturing to the class about the various precalculus topics. He asked questions and expected students to respond as well as provide questions of their own. Only a couple of times during the semester did he attempt cooperative learning experiences. For the most part, Mr. K. considered the course to focus on the development of the individual student's knowledge of precalculus and his activities were correspondent to that goal.

Students' perceptions of Mr. K's teaching

Students' perceptions of Mr. K's efficacy as a teacher varied from student to student. There was no clear consensus that Mr. K. was considered a “good instructor” or a “poor instructor.” Of 25 students responding to a student survey form, four students rated him as “One of the best,” seven students classified him as “Pretty good,” three students felt he was “A little above average,” eight students indicated that he was “About average,” and finally, three students rated him as “Worse than average.” Interestingly, there was no correlation between anticipated grade and rating of the teacher. When asked to further elaborate on their selected rating, many

students provided insights into effectiveness of Mr. K. in presenting, grading, and directing the classroom.

For instance, those students rating him as “One of the best” made comments similar to “... he cares & tries hard to help us do well. Explanations are good, offers for guidance are always given & he is quite encouraging.” The students who considered Mr. K. as a “Pretty good” teacher made comments similar to “Good attitude. Enjoys teaching math and helping students learn.” The three students who categorized Mr. K’s teaching to be “A little above average” did not provide any further elaboration. Of the eight students identifying Mr. K. as “About average” the following comment captured their perspectives about Mr. K’s teaching: “If I really enjoyed math I would take this instructor again because he knows what he’s talking about. However, for those who don’t care so much about the subject, it is difficult to find motivation to really learn in this class.” The last group of students who classified Mr. K. as “Worse than average” tended to focus on a perceived inability of Mr. K. to teach the subject matter as indicated in the following quote “I feel my instructor did the best he could. I feel the instructor was inexperienced and had a hard time making problems understandable, but this will come with time.”

These comments revealed that Mr. K. was able to reach some of the students but others felt that his teaching style and employed methods did not support their particular learning styles. For some students, the outside of class interactions (review sessions, office hours, and time after class) were considered particularly effective, others felt his usage of take-home quizzes to be beneficial, and others mentioned his explanations to be helpful even though some complained that at times they were confusing.

Results and Discussion

From the discussion describing the philosophical background of Mr. K., one can see that he cared for his students but especially those who strove to develop their understanding of the course material. The act of caring, however, did not alleviate all potential class-based conflicts and struggles. The problems that Mr. K. faced throughout the semester involved global issues such as creating a mutually comfortable classroom and generating genuine assessments of student understanding. In addition, he faced several circumstances that caused him to question his worth as a teacher and the goals he had set for the class. These include: (1) coping with students suspected of cheating, (2) dealing with unfounded accusations by a student, (3) watching students give up on the course and fail multiple times, and (4) negotiating classroom disruptive situations. His care for the students revealed itself during conversations, in the midst of the interview, in the classroom, and throughout his journal. In each of these modes, there is clear evidence of Mr. K's attempt to balance his own personal aspirations while accommodating the students' needs and desires.

Negotiating the classroom environment

In his desire to be an effective teacher and negotiate a classroom environment supportive of that goal, Mr. K. confronted losing control as he constructed a non-threatening and open classroom. This was significantly evident in his concern about students talking out of turn. For example, early in the semester, a journal entry contained the following: "I am really trying to make my classroom a non-threatening place but I feel like I may be losing control over the class. For example, a couple of the students talk among themselves during the lectures and don't pay attention. I guess that is their loss." Later in the semester, he stated "I don't know what to think

about my class right now. Maybe I am being too lenient with them. I think that some of the questions that they ask me are to slow down the pace of the lecture time. Tomorrow will be a better day!” Both of these comments evidence the struggles Mr. K. had blending his vision of an effective teacher who utilized an open and non-threatening classroom with a desire for efficiency and order. During the interview, Mr. K. further explicated how he resolved this conflict when stating:

If people want to help each other that’s fine. But, if they just want to talk out in class, I just, a lot of times I’ll just look at the people and they’ll kind of get quiet. And sometimes I’ll have to say well let’s just settle down, but I guess it was a learning experience last year when they, when they did that.

Over time, Mr. K. chose to lose a little control as long as the in-class talking focused on mathematics. He separated this type of in-class talking from talk that was off-task and selected different coping mechanisms for each. For instance, Mr. K. stated during the interview “I kind of learned to just accept it, that, that is a good thing when people do that because I mean you just, for example this semester, I have a former elementary school teacher in class, and with that teacher in side of her, she liked to explain to other people around her, and that’s fine.” However, stated acceptance did not completely alleviate his discomfort as evidenced in the following statement:

I guess the biggest problem that I have is, I guess the most annoying thing is when I explain a problem and she’ll come up to me after class and say I have this question for you, can you do this problem if you would have paid attention when I was doing this on the board instead of helping the people around you, you would understand. But, I, I accept that.

Unfortunately, this student's explanations to her fellow students, although helpful in one sense, resulted in her missing some of the information discussed in class. This, in turn, instigated some general concern about how his vision of effectiveness clashed with his desire for efficiency.

Eventually, Mr. K. came to the realization that many of the students were seeking answers to questions they had but were either uncomfortable or unwilling to voice to the whole class. In fact, Mr. K. stated, "I told the class feel free to ask questions if you do not understand, just stop me and say I don't understand could you go back over that. And maybe instead of asking me questions, to stop class, maybe they were embarrassed or whatever, they just asked the friend beside them, and if, if they knew and could understand enough to explain, hey that's great cause I think you gain more from explaining to someone else..." As a result, Mr. K. made peace with a level of lost control to accomplish his desire to make his classroom a non-threatening place.

Reflections on classroom environment

By definition, teaching effectiveness is based upon an instructor's degree of success in enabling and empowering student learning (Nilson, 1998). But what exactly does that entail? Good teaching, according to Baker, Boggs, and Putnam (1983), involves teachers displaying a student-centered orientation, a value of the learning process, a need to influence individual behavior, and a belief in their power to produced a desired effect in the learner. On the other hand, the NCTM (1995) claims the heart of good teaching involves teachers helping students set and attain goals. Furthermore, Johnson and Roellke (1999) claim the top five criteria for effective teaching include being prepared for class, motivating students, showing enthusiasm, exhibiting advanced interpersonal communication skills, and maintaining classroom control.

Young and Shaw (1999) refined these ideas when they profiled an effective teacher as one who shows value for the course being taught, motivates students, organizes the course well, effectively communicates, develops a comfortable learning environment, shows concern for student learning, and exhibits genuine respect for students.

Creating a non-threatening and open classroom is an integral part of constructing a nurturing environment in which these characteristics can be exemplified. Mr. K's deliberations over whether to allow himself to lose control and create a non-threatening classroom spoke to his desire to open himself to a student-centered classroom. It was clear from classroom observations that Mr. K. allowed some level of control to be lost; however, he was unwilling to completely divest himself of the "Sage on stage" mode of instruction. He expected students to ask questions and permitted them to transition into various ancillary topics; but most of the time, he maintained control as to the directions of the conversations.

Wrestling with assessments

Assessing student understanding was another issue Mr. K. faced as he negotiated his role as a teacher. In fact, Mr. K. consistently voiced his uneasiness with ensuring that all the students received his attention. Early in the semester, Mr. K. wrote in his journal "I feel like I am teaching toward the bottom of the class and some of the students are really bored." Later on in the semester he wrote "I think that a lot of the grad students (me included) want to baby our students too much. When we do that the higher level students aren't challenged enough and they get bored. I also think that when students graduate and get jobs they will encounter problems where they have to muddle through data and words that aren't really relevant to solving that particular

problem.” From the perspective of Mr. K., one of the goals of assessment is to challenge the students.

As a result, he wrestled with the conflict of wishing to ensure students did daily homework even though he did not have enough time to grade them. In fact, Mr. K. stated in his journal “I have a feeling in the pit of my stomach that very, very few of the students are doing the assigned homework. The only problem is I don’t have the time to collect their work and grade it. I wish that I did but I don’t.” In addition, he viewed homework as an inaccurate reflection of student understanding and considered quizzes as more representative. In the interview, Mr. K. stated:

Well, I trust my students to a certain extent and say the take home quizzes are to be done individually whereas the homework assignments that they do everyday they go to the math lab, they can have their roommate help them, the answers are in the back of the book for half the problems at least, I may be naive in say that but since I trust that the students are doing their own work, I, I just think that a tough quiz is a much better gauge as far as doing, as far as how a student is understanding rather than [a homework set].
OK I can copy the answers out of the back of the book or get somebody from the Math lab do my homework for me.... I’ve collected 10 homework assignments, their homework grades are all 9’s and 10’s out of 10 and but their quiz grades are absolutely pathetic. And that tells me that the student is getting help with the homework and ... and the quizzes are what, are what tells me how the students are doing on their own.

Mr. K. clearly felt quizzes were better reflection of student knowledge than homework sets where students could receive help from others. Quizzes, from the perspective of Mr. K., served as replacements for daily homework.

The nature of Mr. K's quizzes reflected the interaction of his perceptions of student's attitudes toward mathematics and his role in changing these attitudes. Specifically, he stated:

... I tried to really challenge my students and make the quizzes very hard. And in that way, they, I don't know I think they gain a deeper understanding, even though they don't want to learn math. I make them [learn math] by making the quizzes harder. They'll appreciate that in the next, in the higher level courses that they have to take then.

This is echoed in another statement he said in the interview "I just want to help them gain as much understanding as I possibly can and if that's through challenging them through quizzes or whatever, that's what I want to do." As a result, Mr. K's felt that it was incumbent upon him to make quizzes that pushed the envelope in terms of time. In fact, Mr. K. stated "My quizzes were 2 to 3 problems with parts a, b, c, and d. It may take a student 2 hours to do it." In appendix A, two examples of quizzes are provided to get a perspective on the composition of those quizzes.

When asked about the nature of the quizzes, Mr. K. responded with "I did not try to trick my students and give them problems that they hadn't seen before but ... I tried to find challenging problems that they would, that weren't immediate, where they would just write the answer down. They would have to put a little bit of thought to them and that sort of thing. I mostly got them out of other books. Sometimes I would think of an interesting problem." In fact, Mr. K. did not consider his interesting quiz questions to mimic the questions involved on the test for he stated "I tried not to ask questions that I thought would be on the test because if I did that then the students would get the idea that all I need to do is study the quizzes. [The students might think] I do not have to gain any understanding. I just have to memorize four or five types of problems from the last two quizzes and that is all. But, I did have some questions that were like is this statement true or false. Explain to me why. But a question that would not have been

on the test.” As a result, Mr. K. viewed the quizzes as opportunities for the students to address the needs of those students who wish to reach beyond simple facility and strive for higher levels of understanding. In fact, Mr. K. stated the following during the interview:

On the quizzes that I give I try to give one or two bonus questions to the ones that really want to be challenged and I, I give questions that are not easy by any means. Especially, on the bonus, especially. I give questions like that just the students that really, really want to learn will try those and they will just come up to me and say I really tried to work on this bonus. It makes you feel good when the students sit down to try for more than five seconds and say well I can't do it.... You have to have an understanding above and beyond just the average.

Thus striving for understanding, according to Mr. K., was the search for the solution of a problem that reached beyond the scope of the obvious solution paths. Clearly, Mr. K. resolved this issue of lack of time for daily homework by implementing weekly quizzes that integrated both computational and conceptual elements.

Reflections on assessment

The struggle Mr. K. faced with respect to creating assessments that would be proficient in assessing student understanding speaks to another instance of wishing to be an effective teacher. With respect to his teaching and assessment, effective teaching from the perspective of Mr. K. also involved creating circumstances where his students could see the connections between the concepts and real world or other abstract ideas. Such a view is consistent with the NCTM's vision of assessment. In fact, some of Mr. K's comments about assessment echoed the following statement in NCTM's Assessment Standards:

Assessments that match the current vision of school mathematics involve activities that are based on significant and correct mathematics. These activities provide all students with opportunities to formulate problems, reason mathematically, make connections among mathematical ideas, and communicate about mathematics. Students engage in solving realistic problems using information and the technological tools available in real life. Moreover, skills, procedural knowledge, and factual knowledge are assessed as part of the doing of mathematics. In fact, these skills are best assessed in the same way they are used, as tools for performing mathematically significant tasks” (NCTM, 1995, p. 11).

The focus on the individual revealed a particular focus Mr. K. held concerning the purpose of his assessments. In particular, he viewed the quizzes that he employed as a monitor of student progress to promote growth of understanding. This is in contrast to the other potential roles that it could have played such as (1) acting as a teacher’s aid to make instructional decisions, (2) serving as an evaluator of student achievement to recognize accomplishment, and (3) making programmatic evaluation to implement program modification (NCTM, 1995).

Although Mr. K. focused his assessments on monitoring student progress, he selected quizzes over daily homework to accomplish this even though according to Williams (1994) “Grading daily assignments is believed to be an effective tool for developing mathematical skills” (p. 145). This choice was borne out of a mix of personal choices and reactions to the ineffectiveness of the homework to distinguish the conceptual and procedural problems students displayed on his quizzes. So, even though daily homework fit into the genre of activities the NCTM (1995) claims as designed to monitor student progress, a quiz-based assessment still satisfies since it “... enhances each student’s learning to the extent that it facilitates and encourages continual learning and helps each student become an independent learner” (pp. 43-

44). As a result, the quizzes, from Mr. K's perspective, accomplished all of these by requiring insight and constructing connections to real life situations.

In addition to struggles that posed conflict for Mr. K. in terms of instructional issues, a variety of problematic scenarios arose as part of teaching the course. These scenarios arose from interactions with specific students rather than arising from global instructional issues.

Dealing with academic dishonesty

About midway into the semester, Mr. K. in his journal (see appendix B for October 31st) stated, "I have a suspicion that the brothers that I have in class are cheating off of each other. They only sit beside each other on days of quizzes or tests. Maybe I am just too paranoid." His paranoia continued to build throughout the semester as these brothers continued to appear to act in ways that raised his suspicion of cheating. In fact, when asked about if there was a particular student who drove him crazy over the semester, he stated "I guess my worst students were a couple of brothers that, although I told them that they had to work alone on their quizzes, they would work together and they would make the same mistakes. And I didn't say anything about it until the end of the semester, the last day of class, I said "Well these take home quizzes they, ... I said it before, they are for you to do by yourselves. Now if you want to do them with somebody else, I would suggest that you would do it with somebody else that knows the right answers because if you copy it off somebody that doesn't know, that means you do not know either and so, but I guess that was my worst, those were my worst students."

Reflections on academic dishonesty

Faculty and students many times conflict over academic dishonesty issues since their views on this subject diverge widely (Higbee & Thomas, 2000; Paldy, 1996; Roth & McCabe, 1995). In general, students have engaged in activities such as sharing homework answers and they consider “collaborating” on large exams or major projects not to be violations of the academic honesty code. Specifically, academic dishonesty involves cheating (the use or attempt to use unauthorized materials, information, or study aids in any academic exercise), fabrication (falsification or invention of any information or citation in an academic exercise), facilitation of academic dishonesty (helping or attempting to help another to commit an act of academic dishonesty), or plagiarism (representing the words or ideas of another as one’s own in any academic exercise). Of these, cheating and plagiarism tend to be the most common complaints by college faculty (Daniels et al., 1996; Schneider, 1999).

The reason that students tend to engage in activities correspondent to academic dishonesty focus on a multitude of causes such moderate expectations for success, fear of failure, desire for a better grade, pressure from parents to do well, disinterest in a core course unrelated to career goals, low levels of self-efficacy, being graded on the curve, being tested on material not emphasized in class, previous cheating activity, perceptions of the social norms encourage cheating, and anticipated benefits of successful cheating (Barnett & Dalton, 1981; Evans & Craig, 1990; Fishbein, 1994; Gehring, Pavela, & Nuss, 1986; Hall & Kuh, 1998; McCabe, Trevino & Butterfield, 2001; Murdock, 1999; Pulvers & Diekhoff, 1999; Whitley, 1998). Cheating, according to, tends to occur the most in classes where However, in face of rampant academic dishonesty, many professors do little or nothing formally about the infractions since filing a formal complaint typically involves a laborious judicial process resulting in a punishment often

unrelated to the offense (Schmelkin, Kaufman & Liebling, 2001; Schneider, 1999). In addition, many faculty members cited a lack of sufficient proof to take formal action or skepticism about the institutional process (Pincus, 1995; Schmelkin, Kaufman & Liebling, 2001; Simon et al., 2003). Teachers are worried about lodging complaints when wandering eyes could be considered the vacant stare of a thoughtful student or what appears to be copied might be the result of students studying together. In essence, many teachers are worried about gathering incontrovertible proof. Instead, professors tend to employ a variety of mechanisms to either squelch or diminish occurrences of academic dishonesty such as (1) stern warnings during tests for roving eyes, (2) walking between the students, (3) making eye contact with them, (4) enforcing removal of ball caps, (5) switching from multiple-choice to essay-based exams, (6) separating students or randomly seating them, (7) banning unnecessary electronic devices, (8) copying answer sheets prior to return, (9) provide all paper, writing utensils or calculators, or (10) using multiple versions of the same exam (Whitley & Keith-Spiegel, 2002). Alternately, other instructors proactively address the problem by handing out lengthy warnings about cheating and conducting weekly discussions of academic integrity (Schneider, 1999).

According to Roth and McCabe (1995), discussions should reach beyond rhetoric and seek to negotiate a corporately held perspective of those policies. This is done to persuade students to change their context-specific behaviors even though it is difficult to alter beliefs. The goal of such discussions is to address not just the symptoms associated with cheating but rather suggest particular techniques to change the overall perception of what academic integrity is and how it should be implemented in the classroom. In essence, Roth and McCabe (1995) and Murdock (1999) suggested that the classroom culture needed to change by enhancing student value of the material being taught, instilling a desire to learn for learning's sake, and infusing a perception

that the students have adequate control over ensuring a successful outcome. Revising a classroom to integrate such perspectives involves (a) aligning assessment practices with instruction, (b) publicizing scoring rubrics which give students information on expectations and components of a good response, (c) utilizing multiple sources of evidence to allow students to display their mastery of a particular concept instead of “high stakes” assessments which increase pressure and anxiety, (d) integrating high-level questions which emphasize strategies over solutions (it is easier to copy answers than reasoning) and (e) shifting responsibility for assessment towards student self-evaluation thereby increasing the power and control the students have over their own learning. In addition, McKeachie et al. (1994) proposed that a teacher provides multiple opportunities for students to demonstrate competence and let students develop class norms for honesty. Implementing these revised perspectives in the classroom places the onus on students to effectively employ self-assessment recognizing what they need to learn what they do not know rather than cheating to cover up personal deficiencies. Finally, others have called for the involvement of students in designing and enforcing campus-wide academic integrity policies or honor codes and peer education on the importance of academic integrity (McCabe & Pavela, 2000; McCabe & Makowski, 2001).

But what if a student does violate the academic honesty policy? Whitley and Keith-Spiegel (2002) warned teachers to be careful if they attempt to employ informal resolutions in the classroom without thorough knowledge of the institution’s policies. In particular, they noted, “Some colleges and universities do not allow informal resolution of cases of suspected academic dishonesty. Other institutions may allow informal resolution under some circumstances but not others, or they may require the instructor to submit reports of informal resolutions” (Whitley & Keith-Spiegel, 2002, p. 118). For instance, some schools, which employ an academic dishonesty

policy instead of an honor code, permit the instructor to determine and impose sanctions against the student for academic honesty violations but put restrictions on the level of sanctions or the number of infractions encountered. In contrast, schools that employ honor codes typically require students to sign a pledge on written tests, exams, and quizzes that indicates they have not violated the honor code during the examination. Many of the honor codes contain a two-fold obligation: from an individual perspective, students must not violate the code, and from the perspective of the community, take responsibility to report suspected violations of the honor code. Any alleged violations of the honor code are to be reported to a central committee that conducts an investigation and then imposes sanctions or acquits the student. As a consequence, it is vital for a classroom teacher to be knowledgeable about the language, requirements, and expectations of an institution's policies concerning academic honesty prior to attempting informal resolutions. Only through following an institution's guidelines can sanctions be appropriately applied.

Some schools have taken steps beyond simple punishments and have begun to require students to reflect on what they have done (Moore, 2002). In addition, schools have become more vigilant in their detection of academic dishonesty that can include online term paper vendors and implementing cyber-cheating preventative and investigative software (Campbell, Swift, Denton, & Mello, 2000a, 2000b; Moeck, 2002). In addition, Goldsmith (1998) identified that modern technology being carried into the classroom provided students with opportunities to compile electronic crib sheets. Hand-held computers, programmable calculators, cell phones, PDAs, iPods, and similar storage and retrieval devices provide students with access to considerable amounts of information. Whitley and Keith-Speigel (2002) suggested that all electronic devices, except those requisite for the exam, be banned during exams. As a

consequence, one might want to consider an explicit policy concerning calculators in mathematics exams and consider implementing a policy of checking for electronic crib sheets. As the means of violating academic honesty codes continues to evolve so will the means of detecting and preventing them. Vigilance is needed by the teacher and institution to not reward cheating behaviors and find ways to acculturate students into a belief that academic dishonesty is counter to their personal goals.

In the instance of Mr. K., he was aware of his University's policies concerning cheating and plagiarism. Specifically, he was aware of the codes of conduct described in the University's Student Affairs Handbook. In this handbook, less than a half a page was devoted to defining cheating, fabrication, facilitation of academic dishonesty, and plagiarism. After providing brief descriptions, a total of nine pages were used to delineate the procedures, appeals processes, and potential punishments. Because of the red tape connected with accusing a student with academic dishonesty, Mr. K. felt it was best to not lodge a formal complaint but rather talk with the students suspected of violating the academic honesty code.

Dealing with questions about grading

Cheating was not the only situation in which Mr. K. experienced frustration with these two brothers. In fact, during the semester, one of the brothers claimed that Mr. K. did not tell them about checking their radical equations. This situation was described more fully in Mr. K's journal entry (see appendix B for November 12th) that stated "One of my students told me in class today that I didn't say that it was a big deal to check their answers when they were solving radical equations. I can't believe it. Every one that I solved on the board, I checked the answer and I even wrote it on the board that they must check their answers. WOW!?!?" When asked

about that situation, Mr. K. stated “ Well, that was very frustrating. That’s like somebody calling you a liar to your face I mean I try not to lie and I try not to trick my students either, so I, I just say well I did, you have to, the book we have now I think, the book says we should, if the read the book, they, they know that, if they listen to me in class they know that, so, and I’m sure that I said it more than one time, so I mean it’s just frustrating but hey . . . you can’t reach every student. As much as I would like to think that I can, I can’t and that was just one instance I didn’t. Or they didn’t listen, whatever.” Field notes from the class confirmed his claim that on multiple occasions Mr. K. had indeed identified as well as illustrated the need to check the answers found when solving radical equations. Unfortunately, this was not the only instance of unfounded accusations experienced that semester. When describing his reactions to the student performance on a test, Mr. K. in his journal stated “There were a few students that confronted me after I passed them back and tried to get some points from me. One kid had the nerve to say that I told him an answer was right during the test when it was really wrong. I hate when people accuse me of such things. Hopefully my class will get on the ball and start working harder.” Mr. K. typically sloughed off such accusations and he attributed them to the students either not paying attention or misconstruing things that he had said in class. However, it was also clear from the commentaries that Mr. K. felt that such accusations were the result of students attempting to point the blame for their poor performance.

Reflections on grading questions

One of the most difficult aspects of teaching for new instructors occurs not in the design or the grading of the exam, but rather the tension that is typically aroused as the exam is passed back to the students. Grades are important at many different levels since institutions of every

sort use grades as a benchmark for admission (Bushaw, 1994). In addition, grade point averages have become notorious gatekeepers to a number of professions. As a result, students ascribe significant worth to the ability of grades to measure mastery of content. However, they tend to incorrectly deem the grades to objectively measure intelligence and self-worth. This situation is further exasperated as students receive back their grades. In fact, McMullen-Pastrick and Gleason (1986) state “When exams are returned, their conclusion about intelligence is intensified, and it is aggravated by their susceptibility to peer pressure. As graded exams are distributed, the anything but idle query “Whadija get?” echoes around the room, and failure becomes a matter of public record” (p. 117). It is no wonder given the importance ascribed to exams and the anxiety they arouse when having to demonstrate content mastery that students choose to rhetorically spar with the instructor in hopes of improving their grade.

Because of the potential emotional impact, Mr. K. opted to minimize the confrontation by only taking the last few minutes of the class period to hand back tests. In doing so, he gave the students limited time to argue or complain. This was minimally better for the students than merely posting grades and refusing to use class time for discussion. One of the reasons that Mr. K. selected this strategy was that he was not involved in grading each item of every test. This was because a graduate teaching instructor would be assigned to grade only one page of an exam for over 700 student responses. Such a methodology permitted consistency in grading over the multiple sections of the precalculus course but concurrently left Mr. K. without a convincing argument as to why a particular grading strategy was employed. In the face of student complaints about grades, he typically stood firm in his response to objections making him appear rigid and autocratic. He felt this was a better stance than caving into the student objections and giving away points as if the whole testing process had no validity.

McMullen-Pastrick and Gleason (1986) state that the first line of defense is to prepare a non-defensive description addressing why the question is legitimate and why a certain answer is correct. Unfortunately, Mr. K. did not always have one at his disposal so in order to dissipate some of the emotion reactions; he used reflective questions after the test that permitted students to write out their objections. Such a practice was consistent with the McMullen-Pastrick and Gleason (1986) suggestion that

If student objections persist and appear to gain converts among other class members (who convert easily, especially if they, too, missed the item), broaden the discussion to include others, forcing a variety of persons to make the point. If the argument has legitimacy, a few strategies can prevent the appearance of caving into student pressure. Defer the decision. Tell students that lecture notes, text material, and possibly other sources need to be consulted and that a decision will be made and explained further in the next class.... Another strategy is to offer students an opportunity to write their objections. Credit alterations can be made on the merit of each individual case... (p. 120).

However, Mr. K's used his reflective questions more to allow students to vent rather than make adjustments to their grades.

These strategies can help a teacher defer the potentially explosive accusations that can erupt over the grading of tests and quizzes although for Mr. K. some further strategies could also have been employed. In particular, Nilson (1998) suggests the following strategies to prevent or resolve grade disputes: (a) clearly state grade policies both verbally and in the syllabus, (b) use multiple graded quizzes, exams, papers, and other assignments to lessen a single assessment appearing to be "high stakes" or permit students to toss out their one weakest performance, (c) make comments on students exams as specific as possible, (d) have students check your scoring

arithmetic, (e) explain how the grades were computed and either discuss the assessment or provide a definitive key, (f) be willing to discard a disputed item that almost all students missed, and (g) inform a student of the proper procedures for pursuing the grievance further if the case appears irresolvable. In addition, if the student's argument has merit, Hadwin and Wilcox (2002) suggest that graciousness is appropriate and an apology would be warranted if a grading error was made. Employing some of these strategies could have helped Mr. K. extend the aura that the students were part of the assessment process and that he as the teacher was willing to listen to carefully constructed arguments rather than emotional pleas.

Another area where grading confrontations occur involves queries concerning extra credit and possible make-up assignments. In response, instructors need to establish clear policies concerning revisions and extra credit publishing it as part of the syllabus (Nilson, 1998). Additionally, specified policies concerning late work, with or without an "approved" extension should be included in the syllabus. If, however, an instructor seeks to be flexible concerning enforcement of the policies, then one should expect students to provide a variety of "good excuses" for missed deadlines. In such a case, the instructor must assess each extension request or request for a make-up on a student-by-student basis to discern valid from fabricated cases. Nilson (1998) also suggests permitting one opportunity for an extension or make-up and all other incidents would be met with regular penalties. In addition, Rishel (2000) suggests informing the students that a make-up will be harder than the original and therefore they should take this into consideration. In doing so, you permit some level of accommodation but do not allow the habitual requests for extensions or make-ups.

Dealing with student failure

Poor student performances lent themselves to another scenario with which Mr. K. continually struggled. In particular, the course that Mr. K. taught was notorious for a failure rate of nearly a third of the students. Consequently, Mr. K. became desensitized and considered students who failed multiple times to not be college material. For instance, early in the semester he said in his journal “Today I met with one of my students and she really seemed as though she didn’t have any motivation to be in school. I sometimes wonder exactly what motivation people have to attend school and why they dislike math so much.” Later on in the semester, Mr. K. described another student on the path to failure.

One of the kids in my class is going to fail for the fourth time. I can’t believe that someone can take a class 4 times and fail it every time. I had thought about giving him a C just for the effort that he has been putting into the course but he gave me an almost blank quiz this morning and he basically told me that he is giving up. I don’t think that I will have a hard time writing an F on his grade report. I didn’t fail him but I still feel bad about him getting an F for the fourth time.

Mr. K. attributed the failures to the students rather than placing the blame on his teaching. In fact, he stated, “Hey, some people are not cut out for college. I mean that I think that this is a separator course for people. The people that fail this one once or twice or ... for the fourth time, I mean these people no matter what year they are in school aren’t going to make it. And, I guess that is good in that way. Throws away the people.” Such a perspective allowed him to view the course as one that partitioned those who should be in college from those who should not. Simultaneously, it allowed him to divest himself from their failure and conclude that he was not failing the students but rather the students were failing themselves.

Reflections on student failure

A variety of studies have pointed to math as the subject matter that serves as a “critical filter” in determining many educational, vocational, and professional options (National Research Council, 1989). Those who continually struggle with mathematics are finding themselves shut out of many of today’s most rewarding and profitable careers. Consequently, failing multiples times in mathematics or any other course does not bode well for a student’s future success. The origins of these struggles have as much to do with the material being discussed as the environment in which the learning is taking place. In particular, the following factors are attributed to student failure: (1) weak or inappropriate curricula, (2) ineffective instruction, (3) disengaging classroom discourse, (4) poor student self-concept, (5) unsuccessful adjustment to school culture, and (6) prejudice (Goodwin, 2000). Other issues such as lack of commitment to school, high absenteeism, mismatched educational goals, over commitment to extracurricular activities, mismatched styles of learning and teaching, reading and vocabulary deficiencies, deficiencies in critical thinking skills, and learning disabilities have been identified by Wilder (1993) and Somers (1988) as contributors to declines in academic success.

Those students evidencing difficulties with remedial or developmental mathematics courses, according to O’Rourke (1999), tend to lack motivation, self-esteem, and maturity. One element, which is tangentially connected with student self-concept and self-esteem, is that of mathematics anxiety. The impact of mathematics anxiety has been established in a variety of studies and clearly high levels of mathematics anxiety have been attributed to decreases in a student’s ability to perform thereby resulting in poor academic progress and high drop out rates (Arem, 1993). In conversations with Mr. K., it was clear that he believed a particular exam result

said nothing about the value or dignity of an individual. He believed that an exam's results did not justify comprehensive conclusions about an individual student's inherent intellectual ability or lack of it. In fact, the first or second grade in a course did not determine a student's success in the course, let alone in life. However, under the weight of multiple failures in this precalculus course Mr. K. did make attributions, whether correct or incorrect, about the potentiality of a student's success at the university and his or her potential vocational prospects.

A variety of activities have been developed to help students overcome this spiral of continual failure. The most widely applied techniques involve the implementation of academic success courses for at-risk college students (Chaffee, 1995; Downing, 1999; Ellis, 1997; Flemming & Leet, 1994; Gardner & Jewler, 1997; Nist & Diehl, 1994; Santrock & Halonen, 1999). These courses develop a common vision of academia, identify the expectations of faculty, and clarify their interactions with the goals and expectations of the student. Simultaneously, they seek to walk the at-risk college student through issues of making themselves a productive student, note-taking and study skills, test-preparation and test-taking skills, and improving thinking and writing skills. Others have implemented attribution training (Hunter, 1996) or developed academic success support groups that involve group counseling (Halstead, 1998). Attribution training involves moving the focus of the students' failure attributions from external factors such as professors or the institution to internal attributions where the students accept personal responsibility for their failure. The group counseling described by Halstead (1998) was developed to help students adopt behaviors that lead to greater academic success by blending attribution training with activities to expose the students to success strategies. The culmination of these group counseling sessions involve the development of a success plan for each student enrolled.

Dealing with disruptive students

Disruptive students can be covert or overt in their actions but the overall effect is that they disturb the overall instructional atmosphere. As mentioned previously, some students engaged in conversations that disrupted the flow of class discussions. Other students were noted as disturbing the tone of the class by reading newspapers during class. In particular, Mr. K. stated during the interview “I have people in class everyday reading the newspaper. That bothers me a lot because when, when I do something I try to take a lot of pride in what I do. Coming to class and reading the newspaper is not, is not something that I would do.” These situations were typical and as a result a constant source of contention.

However, the predicament that created great concern for Mr. K. was the situation where a student walked into class sporting a t-shirt espousing a lifestyle that Mr. K. felt was against his own beliefs. This situation disrupted the flow of the class and affected Mr. K. personally. In fact, his journal characterized this situation in the following manner: “Another troubling thing that I witnessed today was one of my students sporting a t-shirt advertising his own homosexuality. I was truly repulsed by this and had to really restrain myself from vomitting [sic] in class when I saw the shirt. Am I too obsessed with my own beliefs? I don’t really think so.” This situation caused concern on the part of Mr. K. as well as the course coordinator because in academic evaluation, one must not consider factors such as race, color, religion, sex, sexual orientation, age, national origin, political or cultural affiliation, life style, activities, or behaviors outside the classroom unrelated to academic achievement. Fortunately, Mr. K. was able to distinguish between his own personal moral code and the need to not prejudice the assessment of the student’s academic work as seen in the excerpt below from the interview:

I don't make any apologies for what I believe in and if I can, if I can talk to a student about what I believe then I would do that. But, I don't. I teach a math class and not a religion course so I mean it's, it's, I mean I admit that was, that was very hard that day to not say something to that guy because that is, man that made me angry and that made me sick to my stomach and that was just. That was one of the hardest days that I have ever had. But, I don't make any apologies for what I believe in.... I didn't discriminate against the kid after I saw him wear the shirt, I had suspected that, that was his lifestyle was before but when it came time to give, to give grades, I mean, I think that he ended up with a C in the course and he wasn't close to a higher grade but if he would have been then I would have had the same considerations as far as was he in class everyday, I mean did his test scores improve throughout the semester, I mean I would have given him the same consideration. I wouldn't have discriminated.

This situation was indicative of the struggles that Mr. K. faced as a teacher. Clearly, he recognized the separation between his personal religious beliefs and his role as a non-discriminatory teacher.

Reflections on disruptive students

According to Amada (1994), there is an increasing trend at the college level for greater numbers of disruptive students in the classroom. Disruptive acts include: (a) having side conversations during class, (b) sleeping or doing other non-related work, (c) exhibiting a lack of self-discipline, (d) displaying self-destructive behaviors, (e) acting in an overtly harassing manner, and (6) wearing offensive dress. Each of these detracts from the learning environment with some them adversely affecting the well being of participants and potentially lead to legal

ramifications. Consequently, teachers need definitive coping strategies for each of the disruptive actions students display in the classroom. Nilson (1998) stated, “Even minor disruptions can mar the atmosphere, break concentration, and really get under your skin. Yet, no matter what, you are not allowed to lose your temper” (p. 43). Responding to such disruptive actions requires the teacher to recognize the need for tact and according to Kilmer (1998) sometimes humor.

Sarcasm and arguments have no place in the classroom for they create a tense atmosphere, aggravate relations with students, and communicate a loss of control. In addition, Nilson (1998) also touts the need for the instructor to remain calm since losing one’s temper could escalate the situation leading to a loss of sympathy and support from the other students. Keeping composure does not mean that one should accept or tolerate the abuse, rather particular measures should be employed in response.

Perhaps the first and foremost deterrent is a well-defined code of student conduct complete with described procedures for handling disruptions (Amada, 1992). This code can be transmitted either verbally during the first class meeting or through the syllabus. Sorcinelli (2002) advocates that the instructor, in a positive manner, should explicitly describe to the class both appropriate and inappropriate behavior during class. These rules can be delineated as part of the syllabus and then explained by the instructor during the first class meeting. In doing so, the students have access to a classroom behavior contract which makes expectations clear.

So, what if a student does not follow the rules of classroom conduct? According to Mishra (1992), the first tactic would be for the instructor to engage the disruptive student in a discussion about the behavior in a one-on-one setting. Another tactic would be to reiterate the code to the class in general, not singling out offenders out in front of their peers. If these discussions do not help curb the disruptive behavior, it is suggested that the teacher involve non-disruptive students

in modifying the conduct of disruptive ones. Only as a last resort should the teacher bring in a supervisor to deal with a student who has shown repeated behavioral problems (Mishra, 1992).

However, some students do not think that their behavior is necessarily disruptive to the class for instance in the case of always dominating conversation or asking in depth questions. The students feel that they are contributing to not detracting from the learning environment. In the case of well-meaning but disruptive students, there are a variety of techniques to handle the situation. According to the Center for Teaching Excellence (2004), one tactic would be to ask the student to stay after class and bring up the topic in a non-accusatory manner. If the situation involves dominating class time, mention that enthusiasm is appreciated but others might be intimidated by the student's knowledge and assertiveness and that your goal is to ensure that everyone is engaged (Hadwin & Wilcox, 2002). By making an appeal to the student's desire to show their knowledge in class, one can assure the student that you acknowledge their abilities but would like them to take leadership in the class by not volunteering as much. For students that constantly ask questions, the Center for Teaching Excellence (2004) suggested acknowledging the question and deferring discussion until after class in order to not confuse the class if responding to the question would require too much additional information that is not salient to the goal of the problem under investigation.

For instances of psychiatrically related disciplinary problems such as harassment, self-destructive acts, assaults, and vandalism, Amada (1994) suggests involving a college's mental health program in providing help to the disruptive student and advocates the potential use of mandatory psychotherapy as an alternative to discipline.

In the case of disruptive dress, one must remember that under the First Amendment, the right to free speech is vastly protected but “public educational institutions can abridge a student’s speech or dress in the following situations:

1. If the student’s speech or dress demonstrably and adversely affects the health and safety of other members of the college community and;
2. If the student’s speech demonstrably leads to a breach of the peace or seriously disrupts the educational process of the college” (Amada, 1994, p. 78).

As a result, the disruptive speech or dress must have potential to incite a circumstance that simultaneously results in harm to those involved and causes a serious disruption of the educational process. However, if a fellow student brings up charges of harassment from another student’s speech or dress then the situation becomes additionally problematic since it is unclear whose legal rights prevail. Perhaps the best remedy to such a situation, according to Amada (1994), is to seek legal advice from the college attorney and spend time with the two disputants searching for a reasonable compromise with the aid of students from the class or friends of the disputants acting as mediators.

Mr. K. faced several of these disruptive acts in his classroom. He ignored students reading papers in his classroom even though they agitated him, dealt with students conversing during his lectures, and overcame a student wearing clothing disruptive to him. He ignored many of these by either attributing the actions to disinterest with the content or lack of motivation. With respect to the disruptive dress situation, the course supervisor became concerned because of the potential for legal repercussions. If Mr. K. overtly displayed repulsion toward the student and this was continued to be projected for the rest of the semester, then discrimination charges could have been lobbied.

Conclusion

This paper sought to begin a dialogue where the issues and concerns of graduate teaching assistants become a critical element in the research associated with undergraduate education. Only by identifying the problematic issues can one attempt to devise a means of addressing them. At the same time, not all of the attitudes, beliefs, and techniques employed by Mr. K. as he negotiated teaching as a novice graduate teaching instructor should be championed. In providing these, one can gain perspective on some, but certainly not all, of the problematic issues encountered. Simultaneously, the reflections sought to provide the reader with the perspectives of others on the origins of such problematic situations, potential techniques for addressing those problems, and how Mr. K's coping strategies aligned with them. Consequently, this paper has provided a focused glimpse into the world that graduate teaching assistants have been traditionally thrown with little to no training.

Appendix B has been provided to provide the reader with an opportunity to explore the various entries of Mr. K's journal and to see how and when the problematic situations arose during the semester. In this manner, it serves as a useful supplement to this paper and a powerful means of helping TAs gain a vision of issues they might face in their classrooms. In particular, the journal entries provide TAs with glimpses into some of the potential problems and issues that may arise as they begin teaching undergraduate mathematics. However, this is not to say that every potential area of conflict has been addressed. Certainly, teacher-student fraternization and harassment are two issues that could and should be addressed but did not arise in Mr. K's experiences. Other issues such as using cooperative learning activities, technology, or manipulatives need to be explored along with classroom decorum, office hours, and a sundry of

other elements integral to the profession. Although outside of the scope of this investigation, further research needs to be conducted into the difficulties the TAs encounter when implementing innovative teaching tools or methods. By clearly identifying the issues facing graduate students and then exploring the effects graduate students have in the classroom, TA training programs will be able to draw upon the personal struggles and lessons learned by practicing TAs.

Accepting this challenge is easy, but implementing the lessons described can be difficult. Expanding TA training to include elements which are drawn directly from the experiences of real TAs can lead to questions not easily answered and can also lead to examinations of departmental and university policies. Additionally, the development of a training program which addresses the recommendations of the Stephen Rodi (1991) and the Boyer Commission on Educating Undergraduates in the Research University (1998) requires additional commitment, moneys, and the involvement of faculty trained to assist with the training and supervision of practicum experiences.

As further insights into the struggles faced by TAs are compiled, more comprehensive TA training programs can be established. This will in turn help TAs become better prepared to employ the innovative pedagogical tools and strategies becoming infused in undergraduate mathematics courses. Universities will then gain greater confidence in the quality of instruction and undergraduates will be receiving the maximum benefit of well-trained instructors. By drawing from this paper and the research of others, expanded training programs can better serve departmental and university responsibilities while breaking the cycle of poor instruction.

Appendix A

Quiz 3

You must show your work to get full credit. Guessing an answer will get you little or no credit. Find the sum or product and write your answer in standard form.

- (a) $(3 + 5^2 - 7y) + (8y - 1 + 2y^2)$
(b) $(7 - 5x)(3x^2 - 5 - 8x)$

Factor the following. If the polynomial is unfactorable, write “unfactorable”.

- (a) $16x^4 - 1$
(b) $3xy^2 - 4x^2y + 6x^3 - 2y^3$

Simplify the following.

- $\frac{x^{-2} - 1}{1 - x^{-1}}$

BONUS Rob has a fantasy football team, the Milwaukee Menace. Points are scored in the following way: each touchdown counts 6 points, each extra point counts 1 point, each field goal counts 3 points, and for each 25 yards gained 1 point is accumulated. Points are subtracted for each fumble (-2) and interception surrendered (-2). This past week the Menace scored 85 fantasy points. The team scored 3 times as many touchdowns as field goals and one more field goal than extra points. For each three touchdowns scored, there was an interception thrown. There was one less fumble than interception. If the Menace totaled 750 yards, how many touchdowns, extra points, field goals, interceptions, and fumbles did they have?

Quiz 11

- Answer the following statements and justify your answers.
 - True or false, $\log_{1/3} 10 > 0$.
 - True or false, the graph of $y = \log_b x$ is concave up when $b > 0$.
- Solve the following for x , y , or b in the following:
 - $\log_b \frac{1}{25} = -2$
 - $\log_{10} x = 3$
 - $3 = \log_b \frac{27}{8}$
 - $\log_4 64 = y$
- Write each logarithmic expression as a single logarithm.
 - $\log_5(x + 5) + 2\log_5 x$
 - $\log_2(x^2 - 1) - \log_2(x - 1)$
 - $5\log_3 x - 4\log_3 y + 2\log_3 z$

BONUS

True or false, $\log_b 1 = 0$ for every real number b . Justify your answer.

In general, the rules of logarithms are true but there are times when they fail to hold. Explain why the following is a false statement:

The graph of $f(x) = \log_4 x^2$ is NOT the same as the graph of $g(x) = 2\log_4 x$

Appendix B

Mr. K's Journal Entries

August 27th

Before class

I am kind of nervous about class and anxious at the same time. Hopefully I will have a good group of kids to work with.

After class

Everything went well. The class seemed apprehensive to participate at first. They seemed to want to listen. I think that they are scared.

September 5th

I wonder how well the class will do on the quiz that I made up. I thought that they were understanding the story problems from 1.2 but they really didn't. I really want the students to do well on this first quiz.

September 8th

I am kind of disappointed in how my students did but they had no response when I asked them what they thought of the quiz (too hard, too easy, etc...). Maybe they are afraid. I am really trying to make my classroom a non-threatening place but I feel like I may be losing control over the class. For example, a couple of the students talk among themselves during the lectures and don't pay attention. I guess that is their loss.

September 9th

I feel like I am teaching toward the bottom of the class and some of the students are really bored. One student shocked me today by asking me about the standard recursive formula(?). I didn't know that there was a standard form for a recursion. Oh well!!

September 15th

Today wasn't a very good day for teaching factoring. I was running late because I had to pay a bill this morning and I misplaced my watch. I also didn't get a chance to look over the assigned work for section 1.7 and a girl asked me about a problem that I hadn't really thought a lot about. I looked really bad because I couldn't do it on the board. I don't know what to think about my class right now. Maybe I am being too lenient with them. I think that some of the questions that they ask me are to slow down the pace of the lecture time. Tomorrow will be a better day!

September 16th

Today was much better teaching!!!

September 19th

I gave a quiz today that my students really liked so I probably [sic] made it too easy. I can't believe that 2 people skipped the quiz today. I guess that they don't care. Hopefully everyone will do well on the test on Tuesday.

September 22nd

Review today went ok. My students wanted to discuss why $(a^2)^{1/2} = |a|$. I think it all confused them with all the talk. I hope my students will do well. One of my kids really got on my nerves today. I think that he was trying because I wouldn't let him make up the quiz from Friday that he missed.

September 26th

I talked about absolute value graphs and shifting them left and right. Some of my students still want to plot points and one student confronted me with the idea in class. It's kind of hard sometimes to make students that ask stupid questions not feel dumb. One example is a guy asked me why in this interval $[-2,1)$ there is a closed circle on the graph at $x=-2$ and an open circle at $x=-1$. I thought it was dumb at least.

Test Reflection

Working through the test design was interesting. I think that a lot of the grad students (me included) want to baby our students too much. When we do that the higher level students aren't challenged enough and they get bored. I also think that when students graduate and get jobs they will encounter problems where they have to muddle through data and words that aren't really relevant [sic] to solving that particular problem. I am glad that you sought our opinions when constructing the test. I guess what I regard as a reasonable math question didn't really change. I think that a reasonable question is one in which all my students would have the capability to solve. It means that each student has the "mathematical tools" to solve a problem. That doesn't mean that I expect each student to get every problem correct!! When I think of the term testing for understanding one thing comes to my mind, unchallenging. I think this way because some of the students (the higher level ones) will be bored. I also think that testing for understanding leads more toward memorization rather than true understanding of the material. How you can correct this in a "fair" way is probably a very, very hard question to answer. I guess that separating students into high and low level classes is an option, but again how do you go about separating them? Oh well, just a few thoughts and feelings.

October 17th

Today in class there were a lot of people who decided to skip and some of the students who showed up insisted on talking throughout the lecture. It was kind of annoying since it may have been distracting to the other students. Lecturing on Section 3.3 is difficult because some students don't have the ability to think "abstractly" when it comes to graphing without plotting points. Also oblique asymptotes aren't the funnest things to teach.

October 20th

I don't feel like class went that well today [sic]. There were a lot of students that weren't there and I wasn't too happy with the amount of homework that was handed in. It was pretty much pathetic. I was also unhappy with the test scores. I can't believe that my classes average was so incredibly low (63%). There were a few students that confronted me after I passed them back and tried to get some points from me. One kid had the nerve to say that I told him an answer was right during the test when it was really wrong. I hate when people accuse me of such things. Hopefully my class will get on the ball and start working harder.

I guess that everyone's class averages were very low. That doesn't make me feel any better about my class but it does give me some consolation that it's not my fault that my class is doing not as well as I would like.

October 24th

I gave a quiz in class today that I think was really easy. I will be shocked if anyone does really badly on it. I am a little bit behind in the lecturing part of the course. Hopefully I can get back on track in the next week or so. Section 3.6 and 3.7 is a lot for the students to handle. Especially the rational roots theorem. That's very, very difficult for them.

October 28th

Class today went all right. I finished talking about decomposing fractions and started talking about circles. I passed back the classes quizzes today. Most students did very well on them but some did rather poorly. Some of the comments that I got back from the first test were negative but most were very positive. The test was fair to most students. There will be a very hard quiz this Friday for them (in class).

October 29th

I have a feeling in the pit of my stomach that very, very few of the students are doing the assigned homework. The only problem is I don't have the time to collect their work and grade it. I wish that I did but I don't. I think that I will get through section 4.2 by tomorrow and the quiz will cover sections 3.4-4.2. I think that I will make the quiz difficult so the students will maybe study harder for the exam.

October 30th

I am planning on giving a quiz tomorrow that covers sections 3.4-4.1. I think it will be difficult for the students because they really don't want to be studying tonight. Today in class was interesting because I went ahead and covered section 4.2 even though it won't be on the test next Tuesday. There were some students that didn't want me to go on but I did anyway. I know I'll have to go back and talk about it again on Wednesday morning in class but that's all right.

October 31st

I don't think that the students did very well on the quiz today. Some of them just handed in one side of the quiz and left the back side blank. I have a suspicion that the brothers that I have in class are cheating off of each other. They only sit beside each other on days of quizzes or tests. Maybe I am just too paranoid.

October 31st

After grading the quizzes that my class took this morning, I am once again left questioning my worth as a teacher. The class average was 54%. Absolutely pathetic. The most upsetting thing for me is that the quiz was comprised of homework problems with numbers changed. I guess that I shouldn't be upset with my students but I can't really help it. I guess that I care for them. Sounds corny but that's the way it is. Another troubling thing that I witnessed today was one of my students sporting a t-shirt advertising his own homosexuality. I was truly repulsed by this and had to really restrain myself from vomiting [sic] in class when I saw the shirt. Am I too obsessed with my own beliefs? I don't really think so.

November 1st

I gave the quizzes back today and the students asked me to explain every problem on it except the hardest one (or so I thought). I am hoping for a good test tomorrow night but the way things have been going, I am not that optimistic. I am looking forward to Thanksgiving break so that I can take some time away from school. I think that this has been the most taxing on me as far as teaching goes. Or maybe I am just getting to be a pessimistic [sic] old fool!

November 10th

I gave my classes tests back today and I am very happy with the results. The average was a 70%. I think that is the first time a class of mine ever got a C average on a test. I gave the students a take-home quiz on Friday and they handed it in today. I can hardly wait to see how they did. I doubt if very many did well even though the problems were do-able. I also gave my students a writing assignment concerning how they did on the test. Hopefully some of the students will have fun with it. Today was a really good teaching day!!

November 11th

I graded and gave back my classes take-home quizzes. The scores weren't that bad I guess considering that it was a hard quiz. I am still happy about how they did on the test from last week

November 12th

One of my students told me in class today that I didn't say that it was a big deal to check their answers when they were solving radical equations. I can't believe it. Every one that I solved on the board, I checked the answer and I even wrote it on the board that they must check their answers. WOW!?! I can't wait for Thanksgiving. Inverse functions are crazy for my students to understand. Switching x's and y's, solving for y, composition of functions, it's all maddening nonsense (to them)!

November 14th

I gave a quiz in class today that I thought was pretty straight forward but I guess that some of my students had problems with it. I think that everyone needs a break right now. One of the kids in my class is going to fail for the fourth time. I can't believe that someone can take a class 4 times and fail it every time. I had thought about giving him a C just for the effort that he has been putting into the course but he gave me an almost blank quiz this morning and he basically told me that he is giving up. I don't think that I will have a hard time writing an F on his grade report. I didn't fail him but I still feel bad about him getting an F for the fourth time.

November 17th

Talked about logarithms [sic] today. Most of the students had some problems with comprehending the graphs but I think that we will get through it all right. I am really trying to put them at ease with the concept of a log. We'll see when the test comes.

November 20th

I felt absolutely miserable today. I let my class out early today and gave them their quiz for tomorrow as a take home quiz. I hope I feel better tomorrow.

December 3rd

I talked about solving [sic] equations by taking the natural log of both sides. I'm not really sure if my students are getting it or not. They just seem to be sitting there in a daze. I'm glad the semester is almost over. The test results were absolutely horrible. My students average was a 46/80. I'm hoping for an easy final exam so they can do well.

December 5th

I hope that class went well today. I am coming down with a really sore throat and I'm not feeling all that well anyway. I'm really looking forward to the break coming up. I am hoping to review for the final exam next Friday but we'll see. I hope my class is picking up the material that I'm talking about in class right now. Sequences and series are easy concepts to understand at least on a math 120 level but I'm always amazed at how little my students understand.

December 9th

I have a suspicion that the homework that I am assigning this last week is not being tried by my students. I am giving a quiz on Thursday and I guess I'll find out then what they know or don't know. I can't wait for the end of the semester to come around. I hope that finals go well and I can get out of this place ASAP.

December 10th

We finished up section 8.4 today and talked a little bit about the final exam. I am giving a quiz tomorrow and I really hope that my students don't do too badly on it. I made one really difficult question for them but the rest is very do-able. Evaluations are coming tomorrow also. I am hoping that my students put a lot of thought into them but most will probably blow them off.

December 12th

The last day of class is today. I guess I'm pretty happy about that. I calculated my students grades last evening and they were pretty good compared to what I thought they were. I think I won't have more than 20% failure this semester even though I've had two students quit on me. I was suprised [sic] by how many C's there were. Hopefully they will do well on the final exam Tuesday night.

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