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Education 443

March 27, 2011

Write-up #1 (Inquiry)

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| **School** | **Teacher** | **Subject/Grade Level** | **Time** |
| Central Bucks High School South | Mrs. Buzin | Academic Chemistry (11th-12th grade) | 7:25-8:55 |
| Central Bucks High School South | Mr. Gleicher | Academic Chemistry (11th-12th grade) | 9:20-10:50 |
| Central Bucks High School South | Dr. Gever | Academic Chemistry (11th-12th grade) | 1:00-2:30 |
|  |  | **TOTAL HOURS** | 4.5 |

Inquiry in Science Classes: Field Observation 1

I had the opportunity to observe three different teachers teach academic chemistry at Central Bucks High School South. The first teacher I observed, Mrs. Buzin, has been a chemistry teacher in the district for a long time after working in industry. I had Mrs. Buzin for my chemistry courses at C.B. South, and going back to her classroom as an observer instead of a student really opened my eyes. The first activity Mrs. Buzin had the students doing was completing a web-quest activity they had started the previous day. Students had a worksheet about periodic trends with questions and fill-in-the-blanks that they were responsible for completing by exploring the website Mrs. Buzin had given them. The students were allowed to work with the student next to them (in pairs) to complete this assignment. This activity was inquiry based because students were exploring concepts one their own with the help of a website. It was still a much guided inquiry activity because the teacher gave the questions and topics that the students were responsible for completing, but an inquiry activity nonetheless. When the students were finished with the online activity (explore part of a 5E lesson) they had another worksheet to do. Part of this worksheet was summarizing their findings from the explore part of the lesson on an organized table (explain) and the rest of the worksheet was problems that required critical thinking with the new information they found and organized earlier in the class (elaborate).

While the students were exploring, explaining, and elaborating, Mrs. Buzin was circling the room to answer any questions the students might have. Students would raise their hands if they couldn’t find something on the website or if they couldn’t come up with an answer to one of the problems. Sometimes Mrs. Buzin encouraged the students to ask their partner or a classmate to help them come up with an answer (peer teaching), and other times Mrs. Buzin would give hints to nudge the student in the right direction for the answer but the student would still have to come up with his/her own answer. All teachers should handle questions this way because students need to be able to analyze and problem solve, but if a teacher gives obvious clues and answers to students’ questions they take away students’ critical thinking practice (also an important part of inquiry).

At first glance, this did not seem like an inquiry lesson because it wasn’t as “hands-on” as most of the examples are for inquiry; however, not all topics will lend themselves to hands-on activities for inquiry lessons, and web-quests and worksheets can be good ways to make these lessons inquiry lessons. Inquiry occurs when students are engaged in asking questions and finding the answers to these questions (almost) on their own. Even though in the web-based activity the main questions students were looking for were given to them, they were able to explore the website as much as they wanted to in order to understand the concepts and answer any questions that they might have come up with on their own.

The next class I observed was Mr. Gleicher’s academic chemistry class. Mr. Gleicher is a first year teacher originally certified to teach biology but was emergency certified in chemistry in the past year. This class was much different from Mrs. Buzin’s class, as would be expected of a veteran teacher‘s class and a brand new teacher’s class. Mr. Gleicher had warm-up questions on the board for students to answer when they got into class as he walked around and spot-checked homework. The warm-up questions all had to do with one another what the class would cover that day. When Mr. Gleicher was finished checking homework, the class was about ready to discuss the warm-up questions. It became obvious then that these questions were a preview of what the class would talk about today. Mr. Gleicher explained that he didn’t expect the students to know the (whole) answers to these questions, but that they should have some previous knowledge that could help be a starting point for them. Students offered their suggestions and the warm-up exercise become more like a discussion that (with the guidance of Mr. Gleicher) lead into the connections and importance of these concepts to the real world/everyday life. This brought relevance to the lesson which is extremely important for gaining and keeping student interest. Mr. Gleicher was very good at making sure students found relevance in a lot of what they did throughout the entire period.

Mr. Gleicher’s warm-up questions acted as a very good engage part of the lesson once it turned into a short discussion. When I initially saw the warm-up questions on the board and assumed that the students learned the answers to them the previous day, I didn’t think the warm-up could turn into an engagement activity. Since the end of the discussion brought relevance to the topic of study, the activity engaged the students and Mr. Gleicher got into the lesson. Mr. Gleicher had a short (~20 minute) lecture using PowerPoint to teach the students his lesson. This is not the best practice for inquiry, but sometimes in the essence of time lecture is necessary. Even though Mr. Gleicher’s lectured the topic to the students instead of letting them inquire about the topic themselves, he did so in a way that kept the students engaged the entire time. Students actively asked very good, curious questions that were definitely a sign of critical thinking and inquiry on their part, so even though Mr. Gleicher was lecturing, inquiry was still occurring in the classroom.

The final activity for the day was a hands-on lab activity. At each lab bench there were splints soaking in a labeled solution (a different solution was at each lab table) and a Bunsen burner. Depending on the solution it was soaked in, the splint would turn the flame a different color. This was connected to the warm-up and lecture the students had, so this was time for students to explore and elaborate on the lesson they heard. The students rotated around the room to each lab bench observing the different color flames produced for different solutions and recorded their observations. There was one bench that was labeled unknown and at the end of the class the students would be able to identify the elements in the unknown solution based on the flame color. Using their knowledge from the lecture and their observations and recordings from the activity, students were required to problem solve in order to identify the unknown solution. This part of the lesson was especially good for student inquiry because they had to come to a conclusion based on their own observations and knowledge, which is a main part of inquiry lessons.

The last academic chemistry class I observed at C.B. South was Dr. Gever’s class. Dr. Gever was a pharmacist for a long time before becoming a teacher about five years ago, and she had a student teacher (Dr. G, a post-bac) in her class for the semester. I did not see very much inquiry in this class at all, and it was possible the most disorganized, unmotivated class I have seen in all of my observations.

The class started with three warm-up questions written on the board while tests taken two days earlier were passed back to the students. This started the problems. The students were far too interested in looking at their tests instead of thinking about the warm-up questions. When it was time to go over the warm-up question, Dr. G asked the first question to the class and received no response. He had very little wait-time, and proceeded to write the answer on the board. Then he went immediately to answering the second and third questions without even asking the class for an answer. This was very poor use of the warm-up activity because the students barely seemed to pay attention the questions let alone contribute to the answers and get the students thinking about the lesson.

After the warm-up activity Dr. G proceeded to go over the tests the students just got back and didn’t do very well on. It is difficult to make going over tests inquisitive, but there are definitely more beneficial ways than others. Dr. G used an overhead transparency with the summary of the answers for students to look at and check over their tests. He switched the transparencies quickly, asking the class if there were any questions they had about answers before switching each transparency. Especially in an academic class students are not going to willingly put their hand up to be the first person to say they don’t understand how to get an answer. A better way Dr. G could have done this was pick a few questions he saw a majority of the class struggle with and walk through those answers. This is beneficial for the students since it highlights where a lot of them most likely went wrong, and it also makes it less intimidating for a student to raise his/her hand and ask to go over how to do a certain problem. If a teacher goes over answers and helps students find where they went wrong on certain problems, going over a test becomes a beneficial learning experience since students can revisit problems and learn from their mistakes. This was not the case however in how Dr. G reviewed the test.

After “reviewing” the test, Dr. G put in a film for students to watch that was intended to connect what students had just learned to what they were about to get into. The film had good parts of it that made connections to the real world that could bring relevance to the lesson for students, had they all been awake. Dr. G showed too much of the video (almost 40 minutes of the class was devoted to the video). To me and fellow chemistry majors this video would have been interesting, however for a bunch of high school students who don’t know what they’re interested in it was just a boring video they could easily fall asleep to. Dr. G could have picked out a few parts of the video to show to the class, or been better about adding his own highlights and commentary to certain parts of the video. Videos can be useful tools for teachers in a classroom if used properly, but Dr. G’s use of his video seemed more like an excuse for him not to lecture and teach the class a lesson.

After the video, students participated in a competition. There were twelve questions around the room (one at each lab station), and each lab pair had to rotate to and answer each question. At the end of the period the pairs switched papers and Dr. G went over the answers to the questions while the students graded another pair’s answers. This could have been more beneficial to the students if the students answered or discussed the questions before Dr. G gave the correct answers because it would make the students more involved with the topic. Dr. Gever and Dr. G really liked this activity because it got the students up and moving around to basically complete what could have been given as a worksheet. This was a clever idea for tricking students into doing a worksheet rather than having them sit at their desks. The overall idea for the activity seemed to be a good one; however, just as a lot of the activities seen in this class period, it was not carried out very well to spur student interest or inquiry.

Being as this was one of the most disorganized and unmotivated class I observed in my observations, and possibly the least inquisitive class I’ve observed, I think there is a good correlation between inquiry, curiosity, and motivation. I will remember this when I get into a classroom and am facing a room full of students. Although real inquiry is different from what I saw in school and am used to, I want to be able to take the risk and put in the hard work to be able to spur curiosity and have a productive inquiry based classroom so students will learn not only the basics of chemistry, but also how to problem solve and think critically.