Integration of Christian Worldview in Science Teaching – Teaching Philosophy of Science to General Chemistry Lab Students

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Format of Class Sessions

- General Chemistry II Lab meets once a week
 - First hour is a lab recitation
 - Next three hours is actual lab
- First five to ten minutes of weekly lab recitation
- Two Gen Chem II labs (Mon lab, Wed Lab)
- Survey given at start of semester and end of semester
- Students given extra credit for ½ page written discussion of Phil of Sci material ten weeks into the semester

Student Make-up of Class

- 23 in Mon lab 15 in Wed lab
- Freshman and sophomore science majors – Chem, Bio, Eng, PreMed, etc
- Most every student was a science or engineering major with a strong interest in science or engineering

Mini Phil of Sci Lecture Topics

- Simple Baconian Method, Positivism and their problems
- Science as Fact Religion as Value Model and its problems
- Inductivism and its problems
- Falsification and its problems
- Thomas Kuhn The Structure of Scientific Revolutions, (the historical approach)
- Summary quotes
- Leveling of sciences with other disciplines, end of scientism
- Personal observations, impact on Christian Faith

Facts are directly given to careful unprejudiced observers by the senses?





Neglected auxiliary hypothesis – classical electrodynamics does not work the same on the atomic level.

Inductivism – Issues

- This is no such thing as a "scientific proof" generally speaking.
- Science just gives us statements of increasing or decreasing reliability.
 - Some statements are very reliable.
 - Some statements are less so.

Results of Pre and Post Survey

- Most students felt scientists were genuinely trying to discover truth - dropped a little from pre to post
- The philosophy material relates well to chemistry lab material – generally positive but split shift from pre to post
- Able to analyze the perspectives of others better – generally agree but shift to agree increases from pre to post
- Respect for science stayed high and the same in both pre and post

- Class had little effect on their Christian worldview – shift to disagree from pre to post
- Over ½ of both labs class indicated that what they were taught before college did not prepare them for dealing with the philosophical and theological challenges of modern science
- Felt like they could discuss science controversies better – shift to agree
- Faith is about values, science is about facts
 - Mon lab: half agree half disagree on pre, a few more disagreed on post
 - Wed lab: 2/3 agree on pre, hard to tell difference on post

Students quotes on midterm essay

- "The problem with this thought is there is no room in the positivist mind to suggest a higher being who controls the universe." – Shayna
- "In the classroom today faith and morals have no place in the science lab, how can you have one without the other?" – Jonathan
- "I believe that the scientific method is a process in which personal judgments have to be made about data, and those judgments are fallible. So [all] a scientist can do is his best but he has to realize that his theory can't be perfect." – Zach
- ".... It intertwines science and religion so that they actually work together in finding truths in the world around us." Christina

Personal Observations

- Mini-seminar affected the worldview of maybe half of the students in a positive way
- Goal was to debunk scientism, and give students a broader perspective on how science is actually done. Succeeded partially
- It did not minimize the students respect for science
- Scientism in our students is rampant, and not easily debunked
- Need to drop level and scope of mini-seminar and use more chemistry examples
- Students realized usefulness of mini-seminar and did not feel it was a waste of lab time