Scientific Journal Critique

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Before reading the scientific journal article, I sat down and took some notes about what I think scientific inquiry is. I think scientific inquiry is a process of investigations and asking questions. After asking questions and doing investigations, one comes up with a hypothesis. I feel like inquiry is based mainly on asking good questions. Using inquiry in the classroom is going to be very beneficial for students because they are going to gain critical thinking skills along with many other skills associated with an inquiry based classroom. According to Etherington (2011), “Problem-based learning guides learners to useful facts and concepts that would not otherwise have been encountered”(p. 36).

Etherington (2011) states, “Problem-based learning is a student centered method of teaching that involves learning through solving unclear, but genuine problems. It is a constructivist, student-focused approach that promotes reflection, skills in communication and collaboration, and it requires reflection from multiple perspectives”(p. 37). Students are presented with a problem that is unclear and not easy to answer. Many times the problems are real life situations. The scientific method is a process of investigation to use during inquiry. Students must hypothesize, investigate, question, and analyze the problem to come up with a possible solution. They can work in small groups to combine their past and present knowledge about the question. The role of the teacher in the classroom is to be the facilitator. They should be walking around listening to group discussions and asking open-ended questions to help their investigation process.

There are many different ways to use inquiry. Etherington (2011) lists six different ways that inquiry can be used in a classroom. “Ask questions- Have students reflect on prior knowledge and experiences to develop their questions as they analyze the problem at hand”(p. 43). The teacher could facilitate this by asking open-ended, non-directed questions to get the learner to begin to think critically. Students may also ask the person next to them a question to see what their knowledge is about the subject. Small groups may be formed during this time to have students discuss their questions with their peers. “Propose Hypothesis- Develop a hypothesis based on the results of answers to questions and prior knowledge and experiences” (p. 47). After talking to another student or even among the small group, students should generate a hypothesis. This is just an educated guess based on the answers they got from their questions. “Isolate and Control Variables- Design a fair test. Work with one independent and one dependent variable at a time to avoid confusion and erroneous data. Make sure students identify variables that do not change throughout the investigation” (p. 47). At this time the teacher may have the students make a chart. On this chart they can make two columns: Isolate Variables and Control Variables. They will be able to keep this chart as a reference as they go through their investigation process. This can be done in small groups or one large group. “Keep records- accurately record answers to questions for comparison with collected data” (p. 47). Students need to keep a notebook to record all their information. The teacher should explain to them how important it is to record their process. If one thing is changed during the experiment it could change everything. “Reason by Analogy- Compare with findings from similar investigations” (p. 47). Having students keep a journal to record their data plays a huge role in this. A notebook is an easy way to look back at previous investigations and see the results. This may or may not help them come up with a solution to the problem in front of them. Lastly, “Model- Use diagrams, concept maps, graphics, pictures, physical models, and other means to explain an investigation’s findings” (p. 47). The teacher can come up with many different things to do in this category. I personally would have my students make a KWL chart during the whole process. Having pictures and physical models might be very helpful to certain students. The students are graded based on a score rubric. A copy of this rubric can be given to the students so they know what is expected out of them.

The NSTA board of directors state (2004), “The National Science Education Standards (NSES p. 23) defines scientific inquiry as "the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Scientific inquiry also refers to the activities through which students develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world" (p. 1). The article I chose to read and the NSTA statement on inquiry seem to go hand and hand. They both state that inquiry is a diverse way to study the natural world by using evidence from their investigations.

My view on inquiry has somewhat changed after reading the article. I sometimes question myself on if I am going to use inquiry in my classroom. After reading the article and figuring out specific ways I can use inquiry in the classroom, I have become more comfortable. There are more ways to use inquiry in the classroom than I thought.

References

Etherington, M. (2011). Investigative primary science: A problem-based learning approach. *Australian Journal of Teacher Education*, *36*(9), 36-54. Retrieved from http://www.eric.ed.gov/PDFS/EJ940863.pdf

*Scientific Inquiry*. (2004, October). Retrieved September 30, 2012, from National Science Teacher Association website: http://www.nsta.org/pdfs/PositionStatement\_ScientificInquiry.pdf