Barriers to Inquiry: Classroom Management Solutions

Dr. Debbie Jackson
Cleveland State University
d.jackson1@csuohio.edu
Organization of Presentation

1. What is inquiry-based instruction?
2. An example lesson
3. Barriers in your context
4. Barriers in the research
5. Solutions to management barriers to inquiry-based instruction
What is inquiry-based science instruction?

“An inquiry-based classroom:

♦ Engages students in designing the learning environment.
♦ Integrates science laboratories into the regular class day
♦ Uses inquiry in the mathematics classroom
♦ Employs management strategies to facilitate inquiry
♦ Reflects the nature of inquiry by displaying and demanding respect for diverse ideas, abilities, and experiences; modeling and emphasizing the skills, attitudes, and values of scientific inquiry: wonder, curiosity, and respect toward nature; enables students to have a significant voice in decisions about the content and context of their work; and nurtures collaboration among students”

Northwest Regional Educational Laboratory – Inquiry Strategies for science and mathematics learning: It’s just good teaching (http://www.nwrel.org/nwreport/sept97/article7.html)
Types of Inquiry-based Instruction

♦ Variations of inquiry-based instruction from the National Research Council
A case for inquiry-based science instruction

♦ Case studies of two elementary urban science classrooms

♦ Two teachers with very different classroom management styles
  – Both encountered similar classroom management problems

♦ Similarities:
  – Low level questioning strategies
  – Low quality science instruction

♦ Conclude that classroom management strategies must include “meaningful and relevant” science instruction

An example: Crime Scene Investigation Office
Cuyahoga County
Cleveland, Ohio

Welcome to the Cuyahoga County CSI Office

♦ Today, you are an investigator for the CSI Office in Cuyahoga County. The security office at Jackson High School has requested that you analyze some drugs that were found in the lockers yesterday.
Memo from Jackson High School

“Jackson High School has a drug problem. Over the past year, illegal drugs have been seized from student lockers on five occasions. All of these illegal drugs are white powders that look remarkably like table salt. During a recent locker search, investigators collected several zip lock bags filled with a white powder. Before charges can be pressed on the individual in possession, the identity of the powders must be established.” (Walker & Wood, 1998, p. 2-4)
With your CSI partner, discuss these two questions and record your answers.

1. After reading the background information, what is the task at hand for your investigative team?

2. Brainstorm some ways to complete your investigative task.
Materials in your lab:

♦ Samples of the 6 possible drugs
♦ Water
♦ Acetone
♦ Acetic acid
♦ Hand lens
♦ Hot plate
♦ Iodine
♦ Test Tubes

NOTE: You may request other materials
Review of safety procedures in the lab
Overview

1. With your partners write your procedures for testing
2. Create a data table for recording the results of the tests you conduct
3. BEFORE TESTING, CHECK WITH YOUR SUPERVISOR – Dr. Jackson
4. After receiving approval of procedures and data table, test the six drugs
Overview

5. Your supervisor will remove the 6 samples of the possible drugs, due to limited supplies, and give you the sample that was confiscated from the locker at JHS.

6. Write procedures and create a data table for recording results of your tests on the locker sample.

7. Determine the contents of the locker sample using your previous testing.
What barriers exist in your context?

♦ Think:
  – In the space provided list the management barriers you envision occurring during the example lesson

♦ Pair:
  – Find the person with the same number and share your list with your colleague

♦ Share:
  – Discuss as a group (according to color) and create a list of barriers for your group
Some classroom management barriers

- Time and energy
- Classroom constraints (facilities)
- Requires high level critical thinking and problem-solving skills some students may be lacking
- Students waste too much time

Some classroom management barriers

- Safety
- Motivating students to get involved
- Materials management and up

Some classroom management barriers (From my experience)

- One student in a group does all of the work
- Getting students attention without yelling
- Make-up work for students who miss the inquiry-based activity
Solutions Brainstorming

- Find the folks in the room with the same number card, brainstorm a list of solutions, record them on the post-it paper to present to the group
  - 1: Time and energy
  - 2: Classroom constraints
  - 3: High levels of critical thinking
  - 4: Students waste too much time
  - 5: Safety
  - 6: Motivating students to get involved
  - 7: Materials management and clean up
  - 8: One student does all of the work for the group
  - 9: Getting students’ attention
  - 10: Make up work for absent students
Time and Energy Solutions

- Create boxes with materials lists, lesson, and materials for each inquiry-based activity that you do in the classroom.
- Maximize class time by assigning individual students tasks they will have to do and report to the group about (jigsaw).
Classroom Constraints Solutions

- Use large buckets of water
- Allow students to move desks and sit on the floor to do investigations which require more space than the desk allows
- Use plastic containers to store materials that are often used by each group – a group box
High level of Student Cognition
Required Solutions

♦ Scaffold the tasks to allow students to make connections

♦ Begin with lower level tasks/questions and move up Bloom’s taxonomy

♦ Use cooperative learning groups and structure activities that allow all students to use their strengths in the investigation
Students Wasting Time Solutions

♦ Put the groups on the overhead as students enter the room
  – Using numbers and colors
♦ Have extension activities for groups who finish first
♦ Use a timer and be consistent with enforcing the amount of time students have to spend on each part of the investigation
Safety Solutions

- Create safety contracts at the beginning of the year
- Use lab safety “police”
- Include safety manager as a role in the group
- Use a credit card system for broken glassware and/or obeying safety rules – students with all a zero balance at the end of the quarter get a homework pass
Motivation Solutions

♦ Modify inquiry-based activities to reflect the interests of your students
♦ Be enthusiastic about the activities yourself – it is contagious
♦ Allow student choices and decision making abilities within the investigation
Materials Management Solutions

♦ Teach and provide consistent procedures for set up and clean up
♦ Create a checklist for students to ensure they have completed their clean up tasks
♦ Use competition among the groups
♦ Give a cleanest group award at the end of the quarter
Group Work Solutions

♦ Create a “community of learners in your classroom”
  – Classroom Meetings
  – Create an area for students’ voices (ex: complaint can, peace tree, etc.)
  – Establish a problem solving process (ex: garbage can, recycling bin, etc.)

♦ Need to teach students how to work in groups
  – Use a jigsaw approach and have students determine responsibilities of their roles
  – Create situations for students to practice their roles
Group Work Solutions

- Use individual roles within the groups
  - Question manager
  - Materials manager
  - Recorder
  - Leader

- Create situations that ensure individual accountability (ex: use a spinner to call on students during the discussion portion after the activity)

Getting Students Attention Solutions

♦ Use a large timer and stick to the time you set for students to do the activity
♦ Use a bell to get students’ attention
♦ Clap once if you hear me, clap twice if you hear me, clap three times if you hear me – usually by the third time everyone is paying attention
Absent Students Solutions

♦ Advocates of inquiry-based instruction would argue that absenteeism would decrease if students were more engaged during class time
♦ Create alternative/similar assignments
Resources


Resources


♦ Northwest Regional Educational Laboratory – Inquiry Strategies for science and mathematics learning: It’s just good teaching (http://www.nwrel.org/nwreport/sept97/article7.html)