

Does the Use of Inquiry-based Activities Help Junior High Students Foster a More Positive Attitude Towards Birds?

By Vianne Kirchner, Holy Trinity Junior High School, Bloomington, IL 61701

Abstract: At the middle school level, inquiry-based teaching is effective in fostering positive attitudes toward science. I attempted to determine if the use of inquiry-based activities would aid seventh grade science students foster a more positive attitude towards birds. I had the students fill out three questionnaires concerning their attitude towards birds: the first was given before the unit on birds; the second, after the traditional lectures on birds; and the third, after the inquiry-based activities on birds. I found no statistically significant differences in the students' responses to the three questionnaires. Therefore, I concluded that the use of inquiry-based activities did not help students foster a more positive attitude towards birds.

Introduction:

Investigators that have examined the effectiveness of inquiry-based teaching have been supportive of the method (Anderson et al. 1982, Mechling and Oliver 1983, Shymansky et al. 1990). At the middle school level, inquiry-based teaching generally enhances student performance (Mattheis and Nakayama 1988). It is also effective in fostering positive attitudes toward science (Kyle et al. 1985, Rakow 1986).

I attempted to determine if using inquiry-based activities to aid teaching seventh grade science students about birds would help the students foster a more positive attitude towards birds.

Methods:

Before beginning my series of lectures and activities concerning birds, I had the students fill out a confidential questionnaire (see Appendix A) that gauged their attitudes towards birds with questions concerning whether they enjoy watching birds, like birds, understand why they should study birds, would like to study birds in the future, and think birds are wonderful animals to study. I then taught several traditional lectures on birds and handed out basically the same questionnaire (see Appendix B) for students to fill out afterwards. I then taught several bird-related inquiry-based activities, such as determining how strong eggs are, examining the effects of pesticides on eggshells, comparing the size of different birds' eggs using Play-Doh egg models, and looking at how the beaks of birds are adapted to what they eat. After completing the activities, I handed out a slightly different questionnaire (see Appendix C) for students to fill out, which contained additional questions concerning whether they had enjoyed studying birds, preferred the traditional lectures to the inquiry-based activities or vice versa, felt they had learned more from the lectures or the activities, liked birds now more than they did before the unit, and will teach their friends and family members about birds. In the third questionnaire, students were also asked which lesson/activity was their favorite and which was their least favorite.

I used Tukey's test from an Analysis of Variance (ANOVA) to compare the students' responses to all three questionnaires (before vs. after the bird unit lectures and

after the inquiry-based activities, respectively) using the Statistical Analysis Systems (SAS) package (SAS Institute 2001). I also performed Student's t-tests on some of the questions in the third questionnaire using Microsoft Excel to determine whether students preferred the traditional lectures or the inquiry-based activities and whether they felt they learned more from the lectures or the activities.

Results:

Students preferred the inquiry-based activities to the traditional lectures ($P = 0.0000$). They also felt that they learned more from the inquiry-based activities than the lectures ($P = 0.0000$). 41.1% of students stated that their favorite lesson was the inquiry-based activity in which they looked at how the beaks of birds are adapted to what they eat, while 55.9% stated that their least favorite lesson was the traditional lecture on bird characteristics

Unfortunately, I found no statistically significant differences in the students' responses to any of the questions when I compared their responses to the three questionnaires. From the information obtained by the ANOVA, I was able to glean that, on average, the students disagreed with the statement, "I have enjoyed studying birds", posed in the second questionnaire (average = 3.1).

Discussion:

Students did prefer the inquiry-based activities to the traditional lectures and they did feel that they had learned more from the activities than the lectures. The lack of any statistical differences in the students' responses to the questions among the three questionnaires, however, leads me to conclude that, overall: 1) the students did not enjoy studying birds; 2) the unit on birds did not affect the students' likes or dislikes of birds; 3) the students were not interested in studying birds in the future; and 4) neither the traditional lectures nor the inquiry-based activities helped to increase their appreciation of birds.

One possible way to enhance the learning experience for my students would be to have someone give a live bird demonstration to the students. Another possibility would be to have the students take a field trip to either a zoo with a bird exhibit or to have an ornithologist show them how birds are caught in the wild and why ornithologists need, or would want, to do so. In taking a field trip, students would be able to get an up close and personal view of some birds that they would normally only get to see through binoculars, if at all.

Literature Cited:

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Appendix A

Survey on Bird Unit

Dear student:

Over the next few weeks, we will be studying birds. Please answer the following questions about your experiences with and knowledge of birds. Your responses will be treated confidentially. There are no right or wrong answers. Your answers will not count toward your grade. Circle the answers that apply to you.

Question	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
1 I have never studied birds	1	2	3	4	5
2 I do not enjoy watching birds	1	2	3	4	5
3 I have never been on field trips to watch birds	1	2	3	4	5
4 I don't like birds	1	2	3	4	5
5 I do not understand why we should study birds	1	2	3	4	5
6 I can identify some birds	1	2	3	4	5
7 I would like to study birds in the future	1	2	3	4	5
8 Birds are wonderful animals to study	1	2	3	4	5

Please feel free to write additional comments regarding your experiences with or knowledge of birds on the back of this page.

Thank you for your time.

Appendix B

Survey on Bird Unit

Dear student:

Over the past few weeks, we have been studying birds. Please answer the following questions about your experiences with and knowledge of birds. Your responses will be treated confidentially. There are no right or wrong answers. Your answers will not count toward your grade. Circle the answers that apply to you.

Question	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
1 I have enjoyed studying birds	1	2	3	4	5
2 I do not enjoy watching birds	1	2	3	4	5
3 I have never been on field trips to watch birds	1	2	3	4	5
4 I don't like birds	1	2	3	4	5
5 I do not understand why we should study birds	1	2	3	4	5
6 I can identify some birds	1	2	3	4	5
7 I would like to study birds in the future	1	2	3	4	5
8 Birds are wonderful animals to study	1	2	3	4	5

Please feel free to write additional comments regarding your experiences with or knowledge of birds on the back of this page.

Thank you for your time.

Appendix C

Survey on Birds Unit

Dear student:

Over the past few weeks, we have been studying birds. I would like to know how you feel about this unit and about birds in general. Your responses will be treated confidentially. There are no right or wrong answers. Your answers will not count toward your grade. Circle the answers that apply to you.

Question	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
1 Studying birds was interesting/fun	1	2	3	4	5
2 I enjoyed Mrs. Kirchner's lectures on birds	1	2	3	4	5
3 I enjoyed the bird-related activities Ms. Dussourd taught us.	1	2	3	4	5
4 I felt I learned more from the lectures than the activities.	1	2	3	4	5
5 I felt I learned more from the activities than the lectures.	1	2	3	4	5
6 I like birds more now than before this unit	1	2	3	4	5
7 I will continue watching birds even after this unit	1	2	3	4	5
8 I appreciate why we should study birds	1	2	3	4	5
9 I can now identify some birds better than before	1	2	3	4	5
10 I would like to study birds in the future	1	2	3	4	5
11 I did not know much about birds before this unit	1	2	3	4	5
12 Birds are wonderful animals to study	1	2	3	4	5
13 I will teach my friends and family members about birds	1	2	3	4	5

- continued on reverse -

Favorite lesson (circle one)

1. Lecture on bird characteristics
2. Lecture on birds' adaptations for flight
3. Lecture on origin of birds
4. Lecture on bird diversity
5. Lecture on bird reproduction
6. Egg Strength & Egg in Vinegar demos
7. Play-Doh Egg Model activity
8. Beak Buffet activity

Least favorite lesson (circle one)

1. Lecture on bird characteristics
2. Lecture on birds' adaptations for flight
3. Lecture on origin of birds
4. Lecture on bird diversity
5. Lecture on bird reproduction
6. Egg Strength & Egg in Vinegar demos
7. Play-Doh Egg Model activity
8. Beak Buffet activity

Thank you for your time and participation!

Please feel free to write additional comments below.

