INTEGRATING BIOLOGY SUBJECT LESSONS INTO A HIGH SCHOOL VISUAL ARTS CLASSROOM

Edmond Walsh, Thunder Ridge High School, Idaho Falls, Idaho
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Background

Students at Thunder Ridge High School, a 9-12 public high school in Idaho Falls, Idaho, were having difficulty developing compelling subject in their art projects. This action research project was developed in an attempt to help students extract meaning from their observations and understanding of biology concepts related to cells and ecology and translate these thoughts into an artistic expression. Methods for this project were founded in art and science education strategies that promote student-led exploration in art and alternative methods of conveying scientific knowledge.

Methodology

- 19 students across grades nine through twelve enrolled in Art 1 or Ceramics 1 courses participated in this study.
- Over the course of a three-month trimester, students were required to complete four projects. The first and last projects were student-led artistic investigations. The second and third projects explored topics in biology, cellular biology and ecology respectively.
- Biology-based projects began with an introductory lecture covering basic principles of either topic.

How does the integration of biology instruction in a high school visual arts classroom affect student understanding of the artistic process?	Pre/Post Student Survey	Project Comparison	Student Interviews	Teacher Journal Assessments	Cell/Ecology Pre/Post
How do students integrate their understandings of biological phenomena into their artistic expression?	X	X	X	X	X
How do students relate scientific inquiry to artistic inquiry?	X		X	X	
What do students take away from biology instruction in a visual arts classroom?	X	X	X	X	X

Data & Analysis

- No incredible difference was observed in student performance over the course of the four projects. Students score an average of 44.7 points out of 50 on biology-based projects and 43.7 points on self-led work. Performance was highest on Project 2.

	Pre	Interview	Post
Biology Confidence	1.74	1.97	2.37
Art Confidence	1.47	2.1	2.72

Fig. 1. Confidence in biology and art measured on a scale from 0-4 gathered over the course of the study.

- Student excitement for biology-art integration decreased for ten students, stayed the same for eight students, and increased for one student over the course of this study.
- Student performance on biology-based assessments increased significantly for both cellular biology and ecology principles. The normalized gain on Cellular Biology Pre-Post Assessments was 27% and the normalized gain for Ecology Pre-Post Assessments was 45%.

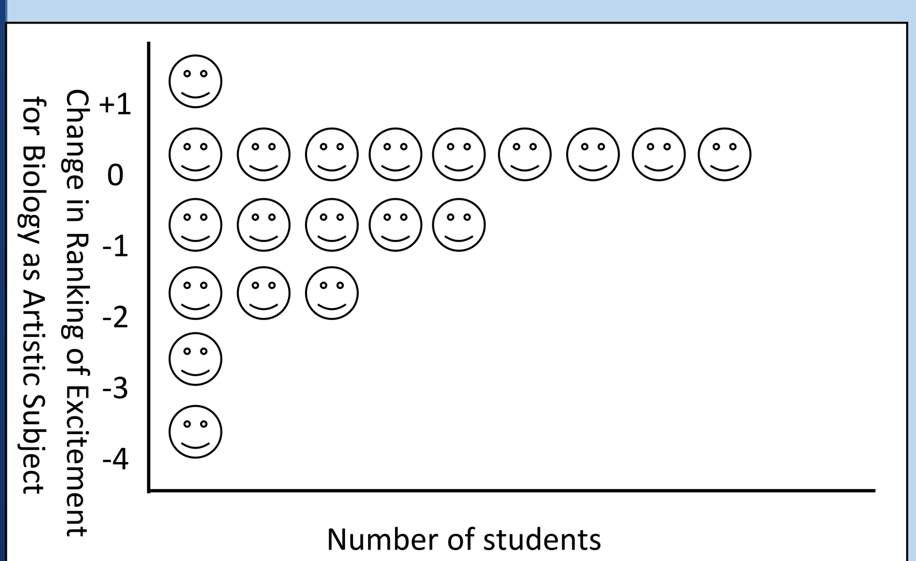


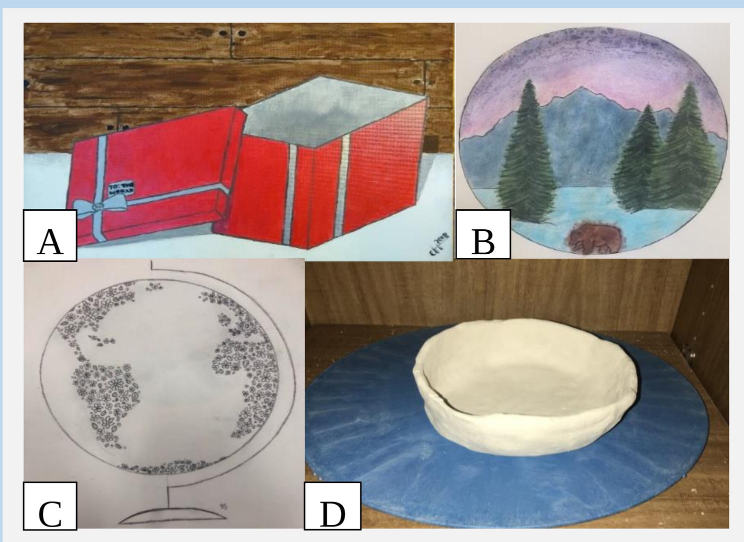
Fig. 2. Comparison of student scores for excitement about biology-art integration from pre- to post-assessments over a scale from 0 to 4.

- Student confidence in artistic knowledge increased steadily from 1.47 out of 4 to 2.72. Student confidence in scientific knowledge also steadily increased from 1.74 out of 4 to 2.37.

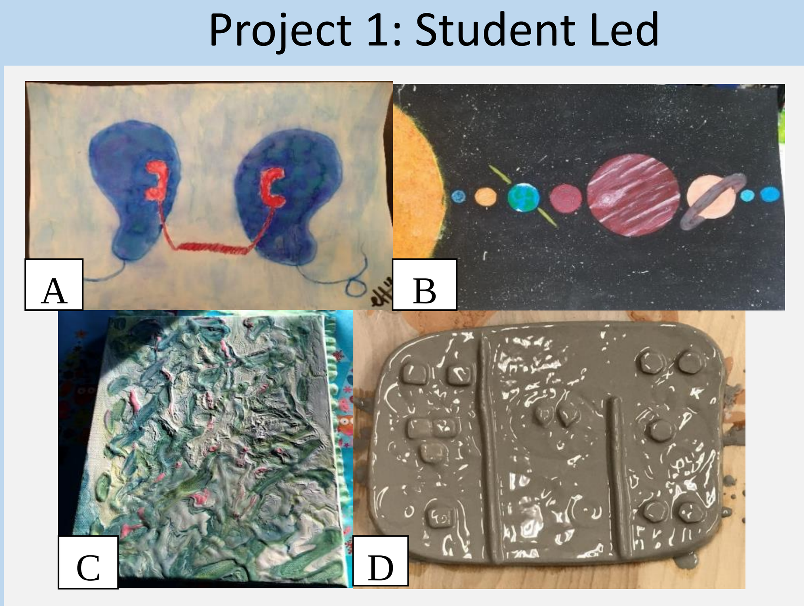
Conclusion

Student understanding of biological concepts grew over the course of this study and students utilized a variety of methods, both literal and figurative, to integrate their scientific understandings into their art. Students understand that the process of inquiry shares similarities in science and art. Students take away boosted confidence and understanding in both science and art through integrated practices.

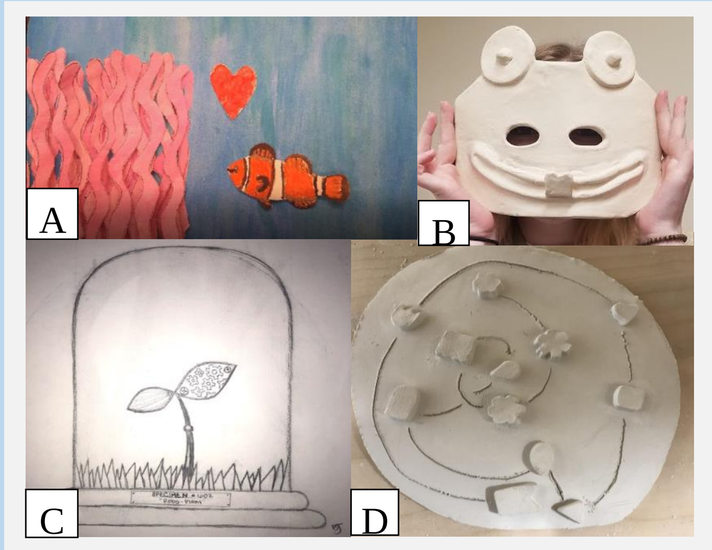
Student Project Examples



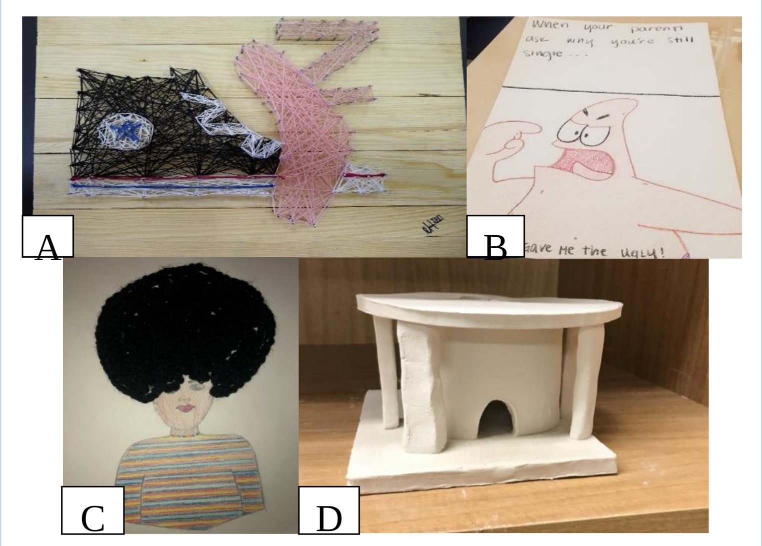
Project 1: Student Led



Project 2: Cellular Biology



Project 3: Ecology



Project 4: Student Led