# Story-telling and writing: A bridge between the practice of science and everyday ways of knowing

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## ABSTRACT:

This paper reports on the unexpected space of story-telling as a bridge between science, everyday ways of knowing, and the imaginary for 5th grade English language learning (ELL) students from Latino backgrounds. The implementation of the Fossil Finders project, an authentic investigation in collaboration with scientists, provided the context for students to be involved in the activities of science and in learning about nature of science (NOS), or opportunities to experience scientific culture. The project also included literacy learning activities, which were integrated into the instructional approach by the teacher and a classroom visit by a scientist, based on student requests. Together, the literacy-based activities and classroom visit by the scientist, contextualized by the authentic investigation, provided the space for story-writing and telling to bring together every day and scientific ways of knowing. Moreover, student stories paralleled their learning about NOS. This project thus demonstrates how the use of stories may equip students to mediate between the every life, school, and scientific understandings.

## INTRODUCTION:

Science instruction is becoming less common in elementary school levels, where instruction largely focuses on math and reading. However, both reading and math skills may be integrated into the context of authentic inquiry-based instruction.. Further, this form of instruction may create opportunities for underrepresented and ELL student groups to *negotiate* cultural differences and understandings about science.

## THEORY:

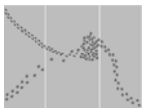
- Drive toward involving students in scientific activities such as inquiry may be beneficial for student science learning (NRC, 1996; 2000).
- Instructionally congruent practices increase the accessibility of science for students with diverse linguistic abilities (Luykx & Lee, 2007).
- Interaction with scientists (Lave & Wenger, 1991) and explicit instruction in NOS (Schwartz, Lederman, Crawford , 2004) provides students greater access to the scientific community
- Addressing science as a cultural way of knowing through explicit instruction in NOS may create opportunities for students to *negotiate* cultural differences and understandings about science (Aikenhead, 1996; Meyer, 2010; Southerland, 2000)..

## RESEARCH QUESTION

***In what ways can the use of stories and creative writing enhance inquiry-based science instruction and instruction in NOS with underrepresented and ELL students?***

## CONTEXT:

- Urban middle school 5th grade classroom involved in authentic scientific investigation, Fossil Finders, using fossils.
- 18 students from underrepresented backgrounds with varying levels of English language proficiency
- Teacher provides language support as a part of instruction
- Students are responding to a prompt by their teacher to write a short story about what may have happened in the "Proposing Explanations for Fossil Footprints" activity, a background lesson in NOS for the Fossil Finders curriculum) (NAS, 1998).

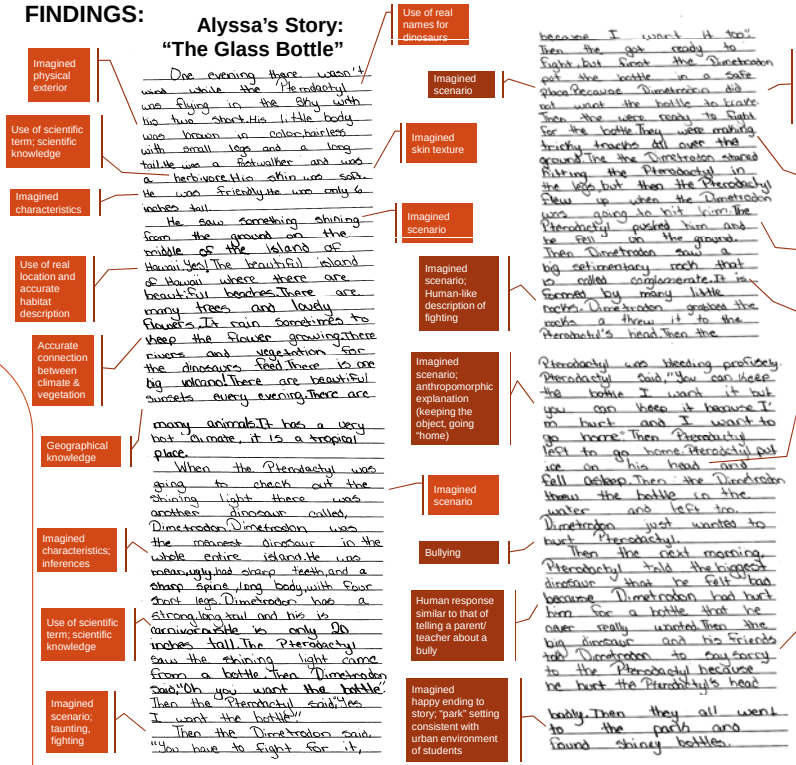


## METHODS:

- Participatory observation approach in collaboration with the focus teacher
- Fieldnotes and video recording of instructional unit (19 days)
- Interviews with 5 focus students before and after classroom visit by scientist

## FINDINGS:

### Alyssa's Story: "The Glass Bottle"

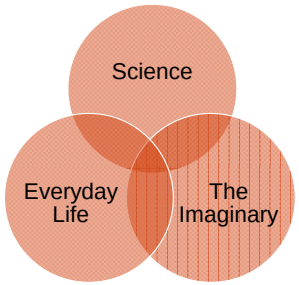



### Creative story-writing about dinosaur tracks created a space for students to merge imaginary, home, and scientific understandings…

**Other student *Fossil Footprint* stories:**
- Use scientific names of dinosaurs
- Describe climate and habitat accurately
- Make use of "evidence" in explanations

**Fictitious and anthropomorphic accounts of dinosaurs as:**
- Being hungry; Not having had "breakfast"
- Mothers protecting their children and/or tending to their injuries
- Bullies and victims fighting; interventions
- Friends that are involved in imagined scenario
- At war (note: several students' fathers were fighting in Iraq)
- Inmates in prisons

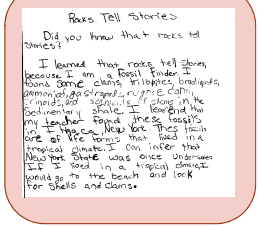
**Students demonstrate evidence of drawing from their everyday life experiences to write these stories**
- Examples used in stories relate to lived experiences of students and are projected to those of dinosaurs




### *Other uses of stories also provide evidence for story-telling and writing at the intersection of science, everyday life, and the imaginary:*

Monica: Who do we know that's on the hunt for a big fossil? Who do we know? [Hands go up] What is the name of the text? I know Brendan knows. And, the man is on the hunt for a fossil of a man-eating animal.
Brendan: The book is called "Fossil Fever"
Monica: "Fossil Fever!" So this would be a text-to-text, right? You can make a text to text connection.

Monica:"If [scientists] *all have the* same facts, why do they have different theories, remember we said it was different stories…the same observations…but different inferences, right? Different takes on what could have been."




## CONCLUSIONS:

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| *Story-writing:* | • Established a new medium to supplement inquiry-based science instruction<br>• Allowed students to make use of home and everyday language<br>• Provided evidence of student understandings about science and aspects of NOS<br>• Created a space for students to bring together understandings, both imaginary and realistic, about science |
| *Story-telling:* | • Fiction and non-fiction text readings complemented science content<br>• Provided space for scientist tells students stories about her work<br>• Provided a medium for students to model aspects of inquiry (questioning, using evidence, and predicting what will happen next) |
| *Teacher's use of Linguistic Scaffolding Related to Stories* | • Made scientific terms accessible ("theories as stories in science")<br>• Facilitated students in making connections between what they were learning and everyday understandings ("text-to-text"; "text-to-self"; "text-to-world")<br>• Allowed students to make use of home and everyday language |

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