Learning Moo-re About the Dairy: Publishing a Middle Level Place-Based Informational Text

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Cover Page Footnote
Author’s Note I would like to thank Mr. Kenneth Graves, Mrs. Jessica Graves, and Dr. Amanda Stone for our tour of the Bearden Dairy Research Center. I would also like to thank the students enrolled in ADS 4421: Capstone in Animal and Dairy Science as well as their instructors, Mrs. Jessica Graves and Dr. Brandi Karisch for reviewing our pages.

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About fifteen minutes from my university’s main campus is the university dairy—a facility that serves as a research and teaching laboratory for students in the animal and dairy sciences (ADS) program in the College of Agriculture and Life Science and a producer of the university’s milk. The milk is sold on campus and turned into cheese and ice cream sold at the Mississippi Agricultural and Forestry Experiment Station (MAFES) Sales Store. While the dairy hosts field trips for many of the local elementary students and other outreach events for the local community, unless you are an ADS student or faculty, it is a place that can be overlooked by many on the main campus. Many of my elementary education teacher candidates had never been to the dairy before and readily admitted that they did not know much about the dairy other than the fact that it produced the milk, cheese, and ice cream sold on campus. Therefore, I decided to have my senior level, elementary education teacher candidates enrolled in a content area literacy and disciplinary literacy course, spend part of their required seminar hours exploring the dairy.

As a culminating project, I thought that creating an informational text, geared towards middle level students, could serve as a tangible reminder of their time at the dairy. It would be something they take with them when going forward into their student teaching and serve as a model for a project they could do with their students in the elementary or middle school classroom. Further, touring the dairy would be a different seminar experience for the teacher candidates than the traditional literacy seminar. Also, this assignment would serve as an example of place-based pedagogy where the teacher candidates investigated part of the local community—the university dairy.

The integration of place-based pedagogy is one way in which teachers can improve literacy in schools (Lester, 2012). The idea behind place-based pedagogy is that learning is rooted in the local community and then expanded outward to the state, country, and global
communities (Smith & Sobel, 2010; Sobel, 2004). Thus, as Rural School and Community Trust (2005) posited, “The community provides the context for learning, student work focuses on community needs and interest, and community members serve as resources and partners in every aspect of teaching and learning” (n.p.). In this instance, the ADS faculty, staff, and students served as resources to the elementary education teacher candidates as they learned more about the university dairy.

Because many of the school districts in my state are considered rural, many of our teacher candidates teach in rural districts, with a large farming population, upon graduation. While some of our teacher candidates come from rural backgrounds and have families that own farms, many of them come from more urban city centers. Consequently, implementing a place-based pedagogy assignment allowed the teacher candidates a chance to experience the world in which some of their future students live and to get out of their comfort zone (Pransky & Bailey, 2002/2003).

**The Class**

The content area literacy and disciplinary literacy class in which this assignment occurred is the final literacy methods course that our elementary education teacher candidates take before their student teaching semester. During the final semester before student teaching, deemed the senior block, the teacher candidates are enrolled in five methods classes—literacy, social studies, mathematics, science, and creative arts. Within the literacy methods course, the teacher candidates are introduced to content area and disciplinary literacy instruction in the K-8 classroom. The teacher candidates design a text set around a social studies or science topic and write four lesson plans that are aligned to the state social studies and science frameworks as well
as the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers [NGA & CCSSO], 2010).

They also spend 120 hours in a field experience (30 hours per content area) where they teach the lesson plans they wrote in the methods classes. The field experience is divided up into two segments—16 hours in elementary and middle level classrooms and 14 hours of seminar (two hours of general seminar and 12 hours of content specific seminar per course). The instructor of the course is responsible for conducting the content specific seminars. In the past, typical literacy seminars have focused on additional strategy instruction, text sets that can be implemented in the elementary and middle level science and social studies classrooms, and licensure exam preparation.

**The Assignment**

The informational book assignment was tied to the Next Generation Science Standards (NGSS Lead States, 2013), the state science framework, and the Common Core State Standards for English/Language Arts (NGA & CCSSO, 2010). Specifically, one of the Next Generation Science Standards (NGSS Lead States, 2013), disciplinary core ideas focuses on studying human activities in agriculture. Further, my state’s science framework includes a content strand in life science, which requires students to explore the characteristics, structures, environments, and development of organisms (Mississippi Department of Education, 2008). Also, the Common Core State Standards (NGA & CCSSO, 2010) anchor standards for writing require middle grades students to write clear and coherent informational texts, engage in the writing process, conduct short research projects on a topic, and gather credible sources that can be integrated into their writing. Therefore, this topic aligned nicely with some of the content that we discuss in class.

When designing the assignment, I also kept the following *This We Believe* (AMLE, 2010)
characteristics in mind: active learning, challenging curriculum, and multiple learning approaches. Having the teacher candidates engage in the research project around a dairy topic allowed them to take an active part in the learning process. Further, the teacher candidates were able to pose their questions about a dairy topic and explored an area of the curriculum with which they were less familiar. Finally, the field trip was an out-of-the-box learning experience for the teacher candidates.

The Visit to the Dairy

It was a chilly but sunny Friday morning in February when we visited the university dairy. The dairy herdsman, who manages the dairy, the undergraduate coordinator from the ADS department, and the Dairy Extension Specialist for the state greeted us. During the tour, the teacher candidates toured the milking parlor, the barn, and learned about the equipment at the dairy. The tour concluded with a visit to the hutches, where the calves lived. After the tour, we came back to the main campus for the remainder of our seminar.

When we arrived back on campus after our visit to the dairy, I started to model the writing process by brainstorming what I knew about the topic of cattle reproduction. I used a K-W-L (Ogle, 1986) as a prewriting strategy to record what I knew about cattle reproduction, and what I wanted to know about reproduction. I thought about what I learned from the visit to the dairy before turning to the computer to find out additional information.

<table>
<thead>
<tr>
<th>Know</th>
<th>Want to Know</th>
<th>Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A calf is a young bovine animal in its first year</td>
<td>• What breeding methods are available to dairy producers?</td>
<td>• Natural service where a bull breeds a heifer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Artificial insemination-technique used by dairy producers to match any bull in the country to their heifers.</td>
</tr>
</tbody>
</table>
Cattle is a term that is used to encompass both sexes

- Bull - male cow
- Heifer - female who has not had babies
- Cow - female who has had babies

How do the dairy farmers know if a heifer is pregnant?

- Milk test - milk samples are tested
- Ultrasound - 2 dimensional images produced
- Palpation
- Blood test - presence of pregnancy-specific protein in the blood stream

The dairy has two types of dairy cows: Jersey and Holstein

Who studies cow reproduction?

- Reproductive physiologists - scientists who study animal reproduction
- Animal scientists

Figure 1. Sample K-W-L on cattle reproduction.

After I finished my modeled instruction, my teacher candidates formed partner pairs and selected a topic related to the dairy to research and engaged in the writing process. They used their laptops to complete their own K-W-L (Ogle, 1986) and started on a draft page of their topic.

Topics

1) Differences between beef and dairy cattle
2) Holsteins versus Jersey cows
3) Raising calves
4) The field of dairy science
5) Careers in dairy science
6) Dairy herdsmen responsibilities
7) Daily workings at the dairy
8) Nutrition
9) Herd management
10) Equipment at a dairy
11) Technology in dairy science
12) Milk quality
13) Products made from milk

Figure 2. Topics for the informational text.

For our second seminar, I modeled the creation of my final draft of my page on cattle reproduction. On my page, I also identified key vocabulary that I believed middle level students
needed to know and provided definitions for many of the discipline-specific vocabulary found on the page.

Reproduction

On the dairy farm, one of the most joyous occasions is the birth of a New Jersey or Holstein calf, a young bovine animal in its first year. How do cattle, a term which encompasses both sexes, reproduce? It’s not surprising to find out that dairy producers and reproductive physiologists, a scientist who studies animal reproduction, have cattle reproduction down to a science. There are two breeding methods available to dairy producers: natural service, where a heifer, a female who has not had any babies, is bred by a bull, a male, and artificial insemination, a technique used by dairy producers to match any bull around the United States with their heifers. If a female cow has had babies once already, she is known as a cow.

Once the heifer is bred, a veterinarian, a professional who practices veterinary medicine by treating disease, disorder, and injury in animals, a reproductive physiologist, or an animal scientist, a professional who has formal training and experience in animal production, care, and use, can determine if she is pregnant. There are various ways to do this including palpation, using an ultrasound machine, which produces a two-dimensional image on a screen, a blood test, which detects the presence of a pregnancy-specific protein in the blood stream, and a milk test, in which milk samples are tested.

A baby Jersey

Figure 3. Final draft of cattle reproduction page.

Once the teacher candidates had completed their drafts, they turned them into me for peer-review. The animal and dairy sciences (ADS) senior seminar class read the pages and provided feedback on the information presented on each page. We spent part of one class period revising our pages according to the feedback provided by the ADS students. After the pages were revised, we edited them for spelling, grammar, and mechanics. Then I took the book to the local copy center and had the book published, so each of my teacher candidates had a copy of our joint work.

Reflection on Book Creation

After we completed the project, I asked the teacher candidates to reflect on the experience. Many of the teacher candidates noted that this was one of their favorite assignments all semester because it allowed them to be creative and they got to see a real-life example of how they could blend science instruction, place-based learning, and literacy instruction into one
experience. Others commented on how they could not wait to bring their students to the dairy for a tour when they started teaching. One teacher candidate wrote, “I am interning in a fifth grade science/social studies classroom in the fall. I would love to bring my fifth graders to the dairy and have them do a similar project in collaboration with the ELA teacher at the school.”

Additionally, the many of the teacher candidates mentioned that the assignment got them out of their comfort zone—they were introduced to another field of study and another part of campus that they had never thought about before. These comments were also reiterated in the end-of-course evaluations. A teacher candidate wrote, “I did not know much about cows until this assignment! I loved seeing the babies at the dairy and learned so much about cows and milk production through this assignment.”

The teacher candidates also appreciated the copy of the dairy book; from their feedback, it was evident that they were proud of their work and excited to share it with others. One teacher candidate noted, “I really enjoyed this class! I am obsessed with our dairy books! Thank you for a great semester!” Another teacher candidate said, “My favorite part [of the class] was doing the dairy farm stuff! It was so much fun, and I loved the class!” This experience also allowed the teacher candidates to engage in the writing process and receive feedback from colleagues who were majoring in animal and dairy sciences.

**Conclusion**

This collaboration with the faculty and students in the Animal and Dairy Sciences (ADS) department and subsequent creation of informational text on the university’s dairy was a successful one. The elementary education teacher candidates were introduced to a place-based pedagogy assignment and an authentic example of integrating literacy and science content together. As a result of this positive experience, further collaborative efforts are in the works.
with additional College of Agriculture and Life Science faculty in hopes to continue providing out-of-the-box experiences for the elementary education teacher candidates.
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