Examining Preservice Teachers' Opinions about Using *A Different Pond* to Teach Math

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Engaging activities that include high level problem-solving should be an integral part of math lessons (NCTM, 2000). To pique students' interests in mathematical tasks, teachers may also introduce the idea of popular children's books. Using children's literature to enhance a math lesson is not a novel concept (Lamberg & Andrews, 2011; Wilburne & Napoli, 2007; Young & Marroquin, 2006), but connections that instructors might want to make can be presented in new and innovative ways that not only address math but people from potentially unfamiliar cultures.

Preservice teachers in the two classes under study had already been introduced to the idea of using children's literature to teach middle school geometry topics through the use of lighthearted, whimsical tales like *Sir Circumference and the Dragon of Pi* (Neuschwander, 1999). For this research, we were interested in examining preservice teacher's opinions about a middle school math lesson based on a non-math themed children's book that involved a much different kind of story. We chose the Vietnamese-based tale entitled *A Different Pond* (Phi, 2017). *A Different Pond*, a 2018 Caldecott Honor book, is a children's book about a Vietnamese father and son going fishing in the early hours of the day to help provide enough fish to feed their family of seven. During the trip, they encounter other fisherman from different cultural backgrounds that add to the depth of the story. The father and son take their catch of crappie home to be eaten for dinner that night. Using this story as the basis for a math lesson, our specific research question was the following: What are preservice elementary (PreK-6) and middle school (Grades 6-8) teachers' opinions about using *A Different Pond* (Phi, 2017) to teach middle school math?

Methods

The participants for the study were future elementary (PreK-6th) and middle school (Grades 4-8) teachers who came from two math education classes covering Grades 6-8 math content and pedagogy. During the fall of 2018, one of the researchers, the instructor of record for the two courses under study, read a portion of the children's book entitled *A Different Pond* (Phi, 2017) to the classes. Since the premise of the story was about a father and son fishing to feed their family, we had groups of 3-4 preservice teachers play the part of families. We had created ponds of crappie, as well as fishing poles, for the future teachers to simulate fishing. Preservice teachers took turns casting their fishing poles and catching one crappie per person in the group.

After each person caught a fish, he or she would record the weight (in tenths of a pound) written on the crappie and return it to the pond. Once all data for the class was collected, the class graphed their weights using multiple data representations, such as stem and leaf plots and histograms, as well as answered an exit ticket. For the exit ticket, future teachers used their group's data to determine whether they would successfully be able to feed their family (group) with the amount of fish their group caught from the pond. In a handout we gave to each table, preservice teachers were given the number of calories an average adult needed for a meal and how much a pound of fried fish would provide in calories for an adult. For homework, preservice teachers were asked to reflect in writing about the lesson activity.

Findings

Of the two classes, 45 students reflected about the book activity. Forty-four of the 45 future teachers stated they enjoyed the activity. The one participant who did not like the activity commented that she

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was confused about the problem and felt her group solved the problem too quickly for her to understand. Thirty-four of the future teachers remarked about how they actually enjoyed “fishing” for the data they used in class. They felt this part was a cute, fun, and engaging aspect of the lesson and that students would enjoy it also. Eight future teachers mentioned they enjoyed the cultural impact of the lesson. One such participant remarked, “I also enjoyed the book because it brought a sense of cultural understanding and relevance into a math classroom, which does not often happen.” Similarly, another preservice teacher added the following comments:

> I liked the fishing book because it integrates cultural awareness. This story has a rare and unique setting that is well explained throughout the book. I think it’s important for children to understand that adults do all sorts of jobs to keep food on the table. I’m really excited that the math classes will start to integrate more cultural activities.

Besides commenting on parts of the lessons they liked, preservice teachers also mentioned ways to improve the lesson. Three preservice teachers commented on not liking the “catch and release” aspect of the activity. The activity was originally intended for future teachers to catch a fish and then throw it back into the pond. They sensed that keeping their fish would be better than throwing them back, which would also lead to more variation in the weights of fish being drawn. Two preservice teachers felt that hiding the amount the fish weighed on the underside would be better than having it listed on the top of the fish because students may try to catch a certain sized fish, such as the biggest, which would affect the outcome of the math problems they were given.

Conclusion

Based on these findings, we feel that math educators can benefit from utilizing non-math based books like *A Different Pond* (Phi, 2017) in the math classroom. As math educators, we are often trying to provide quality math instruction in which preservice teachers not only learn math but also learn math in new and engaging ways. Examining preservice teacher feedback about activities can provide valuable feedback, such as in the literature-based math research conducted by Nelson (2012). Examining preservice teacher feedback about such lessons can help us as math educators revise and modify our current practices to incorporate more themes in the classroom to meet a broader audience and help educate preservice teachers about the world around us. Books such as this one coupled with the standards-based mathematical task described in this article can potentially help address such important math standards for preparing future teachers as set forth by AMTE (2017) that address culturally appropriate topics.

References

Association of Mathematics Teacher Educators. (2017). *Standards for preparing teachers of mathematics*. Retrieved from amte.net/standards

Phi, B. (2017). *A Different Pond.* Capstone Publishers.

Lamberg, T., & Andrews, C. (2011). Integrating literature and math. *Teaching Children Mathematics, 17*(6), 372-376.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school math*. Reston, VA: Author.

Nelson, C. J. (2012). A math-box tale. *Teaching Children Mathematics, 18*(7), 418-425.

Neuschwander, C. (1999) *Sir Cumference and the Dragon of Pi*. Charlesbridge Publishing.

Wilburne, J., & Napoli, M. (2007). Integrating literature & mathematics: A mysterious connection. *Mathematics Teaching in the Middle School, 13*(3), 134-139.

Young, E., & Marroquin, C. (2006). Posing problems from children's literature. *Teaching Children Mathematics, 12*(7), 362-366.