Using Dynamic Geometry Software to Engage Students in the Standards for Mathematical Practice:
The Case of Ms. Lowe

Milan Sherman
Drake University, USA

Carolyn McCaffrey James
Portland State University, USA

Amy Hillen
Kennesaw State University, USA

Charity Cayton
East Carolina University, USA

EXECUTIVE SUMMARY

This case provides readers with an opportunity to consider issues pertaining to the use of instructional technologies in the mathematics classroom. As a narrative case based on a lesson observed in a real classroom, the case reflects the complexities of this context, yet was written to highlight certain themes relevant to teaching mathematics with technology. In particular, how students use dynamic geometry software to explore mathematical relationships, how they engage with the Standards for Mathematical Practice, and the important role of the teacher in this process are prominent themes in the lesson.

INTRODUCTION

Prior to reading "The Case of Ms. Lowe", we suggest that readers complete the Technology Task that serves as the centerpiece of the case, included in the Appendix A following the case. If the reader has access to the relevant instructional technology (in this case, Geogebra), we recommend using this same technology to aid in exploring and answering the questions that comprise the task. This process will allow readers to begin thinking about the key mathematical ideas present in the case and will help to raise awareness of the pedagogical affordances that technology offers for exploring these ideas.

READING THE CASE

Since "The Case of Ms. Lowe" provides a description of actual practice, it reflects the high level of complexity that classroom instruction normally exhibits. In order to help navigate the many issues of pedagogy that arise, we encourage you to pay close attention to certain themes. In particular, what are the high-level thinking demands in this task? How does the use of technology support them? How does Ms. Lowe support or undermine the opportunities for high-level thinking during implementation? Suggestions for important themes to focus on are provided in the questions for discussion section following the case.

BACKGROUND

1. Ms. Lowe is one of three full time math teachers in the math department at a small Catholic high school and the only Geometry teacher. She teaches two sections of regular Geometry, three sections of honors Geometry, and one section of remedial math for seniors. Although her school does have a few carts of laptops, she finds that her class periods are too short (39 minutes) to make them useful, as she needs to unload and distribute them, have students boot them up and log on (which takes a surprisingly long time), and then log off and reload them all onto the cart again at the end of class. Ms. Lowe has found the computer lab to be much more practical than the laptop carts, but the school's computer lab is used as a classroom by the business teacher as there is no other classroom space for her in the school. However, the business teacher prefers a regular classroom with fewer distractions (such as computers), so Ms. Lowe has been able to use the computer lab whenever she wishes by swapping classrooms with the business teacher

28 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/using-dynamic-geometry-software-to-engage-students-in-the-standards-for-mathematical-practice/119145

Related Content

Temporal Event Sequence Rule Mining
Sherri K. Harms (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition (pp. 1923-1928).*
www.irma-international.org/chapter/temporal-event-sequence-rule-mining/11082

Mining Group Differences
Shane M. Butler (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition (pp. 1282-1286).*
www.irma-international.org/chapter/mining-group-differences/10987

Place-Based Learning and Participatory Literacies: Building Multimodal Narratives for Change
Sharon Peckand Tracy A. Cretelle (2020). *Participatory Literacy Practices for P-12 Classrooms in the Digital Age (pp. 74-94).*
www.irma-international.org/chapter/place-based-learning-and-participatory-literacies/237415

A Method of Recognizing Entity and Relation
Xinghua Fan (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition (pp. 1216-1223).*
www.irma-international.org/chapter/method-recognizing-entity-relation/10977

Multiclass Molecular Classification
Chia Huey Ooi (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition (pp. 1352-1357).*
www.irma-international.org/chapter/multiclass-molecular-classification/10997