

# Adoption of Computer-Based Formative Assessment in a High School Mathematics Classroom

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## EXECUTIVE SUMMARY

*This case follows a high school mathematics teacher who is new to the classroom and is looking to adopt computer-based formative assessment as a part of his curriculum. Working within the confines of the school environment, this requires navigating a shrinking budget, colleagues that do not share his value of technology, restricted time, student issues, and limited resources. He must examine all aspects of the available computer-based formative assessment systems and weigh the pros and cons to insure the best academic outcomes for his students.*

*Keywords: Classroom Assessment, Computer-Assisted Assessment, Computer-Based Assessment, Education, Educational Technology, Feedback in Learning, Formative Assessment, Self-Regulation, Social Science*

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## ORGANIZATION BACKGROUND

Wilderness Central School District is a public district serving approximately 3,500 students in grades Pre K-12. The district was created in 1948 when five smaller districts were consolidated in the interest of centralizing and sharing resources. The district is located in an area classified as “rural fringe” by the U.S. Department of Education Institute of Education Sciences in the northeast region of the United States near the state capital. This area has seen a steady population increase as new industries based in technology have moved into the region bringing jobs and business opportunities. Employees of these new companies do not wish to live within city limits, preferring more suburban neighborhoods as well as quality schools. The school district of the state capital has been facing budget cuts and decreased state aid for the past five years, leading to limitations in resources. Like many inner-city schools, the capital city district has difficulty recruiting and retaining quality teachers. Newcomers to the area who possess the means often choose to live outside the reaches of the city school district. A majority of the faculty and staff working at Wilderness CSD live in the district while some, living in adjoining districts, exercise

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an option offered by Wilderness to bring their children to the district tuition-free. Employees of the district have a great deal of pride in their schools and their community.

As a public school district, Wilderness is open to all students living within the boundaries of the district. The demographic profile of the district is quite homogeneous and the majority of the residents are white. Due to the association with the local industries, most households fall at about the median income level for the state. As such the state has categorized the district as an average needs district using a ratio of available resources to resources necessary to provide for the needs of all students.

The school district shares a similar makeup to the surrounding community. Residents of the district pay school taxes which, when combined with aid from the state, supports the school's budget. Like the capital city district, Wilderness has seen cuts in state aid in recent years and has been forced to rely on reserve funds to avoid a large school tax increase. However, sustained cuts have resulted in the depletion of reserve funds and boosted the tax burden of the district residents. Residents are evenly divided on the issue and school budget votes have been decided by relatively few votes for the past three years.

The district's high school, Wilderness Senior High School, serves approximately 1,200 students in grades 9-12. The school underwent restorations around ten years ago to address structural issues. As the state funds were much more available at that time, Wilderness High received a grant to rebuild their football field with a running track, add a wing with ten new classrooms, and build an updated rehearsal studio for the school band. At that time, several parents and community members petitioned the school board to invest some of the funds received into technology for the high school. However, as the school building required construction to fix the structural issues, the board decided that the funds from the state would be used to expand the scope of the building project.

Since passing on the opportunity to use state funds to bolster technology in the school, Wilderness High has attempted to keep up with advances in educational technologies. Unfortunately the school has fallen behind due to a lack of drive to include technology in the curriculum and unavailability of funding. The school librarian is responsible for managing what technology the school possesses, which consists of two computer labs accommodating 30 students each and ten LCD projectors that can be checked out by teachers with advance notice. These resources must be shared between approximately 110 faculty members. Additionally, all teachers have either a laptop or desktop computer that is used for attendance and student data management. Approximately one-third of classrooms, predominantly science labs and English classrooms, have at least one computer available for student use.

Bill Rogers is a recent graduate of a teacher education master's degree program at a small public university in the northeastern United States. Prior to this, he earned a bachelor's degree in mathematics at the same university. As a part of his teacher education program, Bill took courses in assessment and educational technology. In his assessment course he learned about formative assessment which describes a system of assessment for learning as opposed to assessment of learning (Stiggins, Artur, Chappuis, & Chappuis, 2006). Bill knows that students are routinely subjected to high-stakes standardized tests to summatively assess their knowledge. He hopes that he will have the opportunity to implement formative assessments in his classroom that help students progress in their learning instead of just evaluate their status.

For most of his life Bill has been interested in technology. He enjoys working with computers and is fluent with many popular software titles as well as basic hardware issues. Taking a course in educational technology, Bill was excited to learn about all of the ways that technology can enrich the curriculum in a classroom. As a new hire tasked with teaching algebra and geometry

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