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A REVIEW OF READING AND WRITING THE WORLD WITH MATHEMATICS: TOWARD A PEDAGOGY FOR SOCIAL JUSTICE BY ERIC GUTSTEIN

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Freire and Macedo (1987) responded to the crisis of illiteracy and called "for a view of literacy as a form of cultural politics" by urging educators to teach their students how to read the word and the world. Eric Gutstein applies this idea to the mathematics discipline in his book, *Reading and Writing the World with Mathematics: Toward a Pedagogy for Social Justice*. His book is based on research from his very own classroom where Gutstein not only teaches math, but he also encourages his students to think critically about social issues affecting their community. He provides examples of ways to adapt reform mathematics curricula to bring about social justice through the development of math literacy. Through these examples, researchers and educators can gain an understanding of how Gutstein interprets what it means to teach for social justice.

Gutstein welcomes us to his middle school classroom in the Mexican and Mexican American community, "Morningside," located in Chicago. The first chapter opens with a quote from Lupe, an eighth grade student, who reflects on how the assignments Gutstein provided made her a stronger person. This sets the stage for the rationale for politicizing mathematics. The author argues that his students need to be prepared to investigate, critique, and challenge injustice, which is why he supports the notion of educating for liberation. This fundamental goal is evident throughout the next few chapters as he clearly presents the ways in which he challenges his students' past understandings in an effort to cultivate their sociopolitical awareness. He accomplishes this by sharing with the reader the projects he assigns his students as well as numerous examples of actual student responses to the many questions that were involved in each assignment.

In one example, Gutstein asks his students to calculate how many 4-year scholarships the government could offer high school graduates from Morningside if they were to manufacture one less B-2 war bomber. Through relentless questioning, the students are challenged to clearly explain the math involved in their calculations, but to also take a political stance on how they feel about the idea that many generations of students could receive scholarships if the government were to produce one less war aircraft. The students are to answer many "why" questions about the reasoning for their calculations as well as for their position on the political issue involved. This process, Gutstein argues, is necessary in a classroom purporting a social justice stance toward education.

In the later chapters, Gutstein includes the voices of the students and parents he serves. Chapter seven is written by four of Gutstein's former students and co-researchers in their sophomore years in college as they reflect on their social justice oriented mathematics experiences in seventh and eighth grade. The next chapter provides accounts of the reactions of his students' parents. These two chapters provide evidence of the researcher's belief that a classroom must be co-created. A co-created classroom is one in which the students are able to freely discuss otherwise taboo topics through in-depth discussion and questioning. Additionally, it is one in which the teacher, students, parents, and community stand in solidarity on issues of concern. The book concludes with implications for curriculum development, teacher education, and teaching mathematics.

The nature of this book may not allow for explicit guidance for implementing a social justice mathematics curriculum, but it does provide important lessons that can be helpful for its readers. Gutstein provides detailed descriptions of what he did in his classrooms, abundant examples of various student responses, and reflections on his own struggles and regrets. This can seem exhaustive for readers looking for directive instruction for creating a social justice based mathematics classroom. Gutstein's piece must, instead, be read as one that answers questions about how a social justice curriculum could be implemented but at the same time raises questions about how best to do so. His examples report concrete ways that students may respond to social justice oriented projects both inside the classroom and in their lives, which is informative for reflecting on how best to prepare for a variety of responses, including those normally unexpected. Also, Gutstein's candid reflections, questions, and regrets serve as a springboard for further thought and consideration. For example, Gutstein discusses that students in different academic tracks responded differently to his material, generating more positive and constructive responses from his honors classes. This challenges future researchers and educators to think about why there is a difference and how best to adapt his ideas to lower performing students.

Readers may also find it difficult to relate to Gutstein's experiences because his setting is specific and conducive to his implementation, which is not the norm in classrooms across the country. The principal at his school supports his initial implementation of social justice projects, and these projects are presented alongside the school's Mathematics in Context curriculum, which is also based on teaching mathematics concepts by presenting them in a real-world context. However, there is

ample room to learn from Gutstein's experience. Gutstein describes his battle and victory, supported immensely by the community, against a new principal who found his work so controversial and inappropriate to the classroom that he had Gutstein terminated. Gutstein's unique story cannot directly answer how teachers with different school conditions can work against difficulties of administration and a mandated curriculum, but he does provide a picture of his own struggles that may help guide and encourage others in their own battles.

Reading and Writing the World with Mathematics embodies the dialogue that is necessary for critical pedagogy. Rather than declaring that he has the answers, Gutstein adds his voice to the conversation about constructing an education that supports social justice. Genuine, thorough, and reflective, the book serves as both a report of a practitioner research project as well as a story that illustrates that mathematics education can be meaningful and empowering. Gutstein provides concrete examples to support the research that asks educators to rethink the way they teach to include culturally relevant instruction (Ladson-Billings, 1995). The inclusion of detailed and abundant student responses paint a vivid picture of the way students honestly grapple with the complex sociopolitical issues arising from their projects. Furthermore, the inclusion of parent responses and even uncensored student voices add to the richness of Gutstein's work, validating non-academic voices and thereby bringing to life his belief in solidarity and co-creation of knowledge. Gutstein's self-critical reflection on his struggles, regrets, and limitations also adds complexity. Gutstein's book cannot be taken as a prescription for what a mathematics classroom must include but rather a story of what a mathematics classroom can look like, with all of its difficulties and complexities that make it a genuine human struggle for something better.

References

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