What Works Better than Traditional Math Instruction
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In the field of mathematics education, there has been a shift away from traditional teaching methods towards more student-centered approaches. The old school model, characterized by rote learning and memorization of math facts, is being replaced by methods that emphasize problem-solving and critical thinking. This page discusses some of the changes in mathematics education and the implications for teaching and learning.

The Old School Model

The still-dominant Old School model begins with the assumption that kids primarily need to learn “math facts”: the times tables, rules for adding and subtracting, and algorithms for long division. This approach is based on the belief that mathematics is a set of rules and procedures that can be taught and learned through repetition and practice. However, this model has been criticized for not fostering deep understanding and for focusing too much on procedural fluency at the expense of conceptual understanding.

Constructivist Approaches

Constructivist approaches, on the other hand, view children as active learners who construct their own understanding through exploration and discovery. This approach emphasizes the importance of students’ prior knowledge and experiences, and encourages them to make sense of new information in ways that are meaningful to them. Constructivist teachers, such as Kamii, have argued that children should be allowed to make mistakes and learn from them, and that the teacher’s role is to facilitate and support this process.

In one study, Kamii observed that children who were allowed to explore and discover mathematical concepts on their own were able to develop a deeper understanding of the subject than those who were taught traditional methods. For example, when asked to solve a problem such as “1/2 + 1/3 = ?”, children who were allowed to use blocks to represent the fractions were able to see that the answer was not a simple fraction, but rather a rational number. This approach also allowed children to develop a more intuitive understanding of the relationships between numbers.

The Role of Errors

Constructivist approaches also recognize the importance of errors as a means of learning. Errors are not seen as mistakes to be avoided, but as opportunities for exploration and discovery. In the study mentioned above, children who were allowed to make errors and discuss them with their peers were able to develop a more robust understanding of the concept of fractions.

Conclusion

In conclusion, the traditional model of teaching mathematics is being replaced by more student-centered approaches that emphasize discovery and exploration. These approaches are designed to foster deeper understanding and to encourage children to develop a more intuitive sense of mathematics. As teachers, it is important to recognize the value of children’s prior knowledge and experiences, and to provide them with opportunities to explore and discover mathematical concepts on their own.

References
