

OPENING THE MATHEMATICAL HORIZON USING OPEN-ENDED TASKS

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Boaler (1998) claims that open-ended tasks and projects help students develop conceptual understanding of mathematics. Zevenbergen (2001) supports Boaler's claim with a caution that if the tasks are too open-ended it might lead to confusion and ambiguity. Because of a huge potential to enhance student learning, I have been using open-ended tasks in my teaching of elementary and secondary school preservice teachers. This poster focuses on how open-ended tasks can convince preservice teachers that mathematical problems can have multiple correct solutions. This is very important for preservice teachers because many of them believe that a mathematical problem has one right answer and there is usually one correct way to solve it.

In this poster I will provide how preservice teachers struggled and eventually learned a great deal from the following problem. It is noteworthy that one of the preservice teachers claimed that there are 32 solutions to this problem, all of which will be provided in this poster in a pictorial format.

Problem. Use the 9 digits 1, 2, 3, 4, 5, 6, 7, 8, 9 to fill the nine squares below. Each digit may be used only once to make a true addition statement.

$$\begin{array}{r} \square \quad \square \quad \square \\ + \quad \square \quad \square \quad \square \\ \hline \square \quad \square \quad \square \end{array}$$

References

- Boaler, J. (1998). Open and closed mathematics: Student experiences and understandings. *Journal for Research in Mathematics Education*, 29(1), 41-62.
- Zevenbergen, R. (2001). Open-ended tasks: The dilemma of openness or ambiguity. In M. van den Heuvel-Panhuizen (Ed.), *Proceedings of the 25th Conference of the International Group for the Psychology of Mathematics Education* (Vol. 4, pp. 447-454). Utrecht, The Netherlands: Freudenthal Institute.