Systematization vs. Randomness

When Shalom Aleichem returned from a visit to Switzerland, he was asked if it is really as beautiful as people say. "The view isn't bad," he replied. "Too bad it's hidden by the mountains."

Anyone who has ever set foot in elementary school knows that the image of the teacher as a funnel and the students as receptacles is entirely preposterous. It is impossible to lecture in elementary school. The children won't listen even for one moment. Teaching children must be interactive, through experimentation and discussion. If so, what is special about the investigational approach? The secret is in systematic vs. random teaching. "Investigation" means forgoing systematization. Knowledge is not established heel to toe, with the teacher's, or textbook's, guidance. Instead, random activities are pursued, through which the child is supposed to discover mathematical structure on his own.

I believe that the true origin of this approach is in the misunderstanding of the depth of elementary school mathematics. In this sense it is no different from high school or even higher mathematics. It is just that its principles are finer and less discernible. Just as we don't expect students to discover the principles of university mathematics without guidance, we cannot expect them to do so in elementary mathematics.

Another idea behind the investigational approach is the discovery of the beauty of mathematics. Simple arithmetical operations, according to this approach, are boring. They are a hurdle that must be overcome on the way to the real mathematics. The beauty of mathematics lies in creative activities.

As mentioned in the introduction, I also started out with such an approach, and I am no longer proud to say so. I learned that dessert cannot replace the main course, nor can mathematical diversions be taught to those who do not understand the foundations. Furthermore, the four arithmetical operations and the decimal system are not mountains hiding the view. They are the view, and the beauty lies within them.