The Statistics teaching in middle and high schools is part of the discipline of mathematics. Good preparation for future mathematics teachers is an important strategic action to enhance the presence of statistics in the society. A challenge to be faced is to improve the quality of statistics education offered in colleges and universities that are preparing these teachers. We present in this article some activities used in an introductory course for Mathematics Education degree of the Institute of Mathematics and Statistics, University of São Paulo, Brazil. We also discuss quantitative results comparing different editions of the course. The activities developed appear to have contributed to better student learning.