ZMATH 2016b.00827

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Statistical analysis when the data is an image: eliciting student thinking about sampling and variability.

Stat. Educ. Res. J. 10, No. 1, 15-34, electronic only (2011).

Summary: Results of analysis of responses to a first-year undergraduate engineering activity are presented. Teams of students were asked to develop a procedure for quantifying the roughness of a surface at the nanoscale, which is typical of problems in materials engineering where qualities of a material need to be quantified. Thirty-five teams were selected from a large engineering course for analysis of their responses. The results indicate that engagement in the task naturally led teams to design a sampling plan, use or design measures of center and variability, and integrate those measures into a model to solve the stated problem. Team responses revealed misunderstandings that students have about measures of center and variability. Implications for instruction and future research are discussed.

Classification: K75 K45 D35 K85 K95 M55
Keywords: statistics education research; statistical modeling; engineering statistics
http://iase-web.org/documents/SERJ/SERJ10(1)_Hjalmarson.pdf