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Schoolteacher trainees' difficulties about the concepts of attribute and measurement.

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Summary: “Attribute” and “measurement” are two fundamental concepts in mathematics and physics. Teaching these concepts is essential even in elementary school, but numerous studies have pointed out pupils' difficulties with them. These studies emphasized that pupils must learn about attributes before being taught how to measure these attributes, which can be done through activities involving comparing and sorting. In France, as in numerous English-speaking countries, official teaching instructions for the elementary-school years (Grades 1 to 5) recommend this approach. We consider that to be able to teach attributes, teachers themselves must master and differentiate the concepts of attribute and measurement. Indeed, these concepts are part of any teacher's subject matter knowledge, especially of what Ball called “specialized content knowledge”, which is needed to effectively teach both attributes and measurement. In this study, we analyze the level of mastery of these concepts among French teacher trainees. Our findings suggest that future teachers do not clearly differentiate these concepts, and that the concept of attribute is the less well understood. We highlight that an erroneous understanding of attribute is extremely prevalent: almost half of our participants think of attribute as a vague, imprecise notion. Finally, we discuss the possible causes of this misconception and its implications for teaching.

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