A Tribute to Anna Sierpińska

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The IJRUME editorial team was deeply saddened to learn of the death of Anna Sierpińska on October 19, 2023. She was a major figure of the international community of research in mathematics education, and, in particular, she made significant contributions to University Mathematics Education.

We briefly mention here some of Anna Sierpińska's work in connection with UME; we invite IJRUME's readers to refer to the full obituary in *Educational Studies in Mathematics*, of which Anna Sierpińska was editor-in-chief from 2001 to 2005.

Anna Sierpińska worked in the 1980s (then at Warsaw University) on the concept of epistemological obstacle, in particular concerning the topological notion of limit (e.g., Sierpińska, 1987). She uncovered a set of such obstacles, in particular related to number and infinity, and showed the difficulties these obstacles could cause for students. Beyond this case, she proposed an ambitious research program around the notion of epistemological obstacle.

She has also contributed to research into the teaching and learning of linear algebra (e.g., Sierpińska, 2000). In this field, she identified three modes of reasoning for students, associated with different types of language used in linear algebra: "the 'visual geometric' language, the 'arithmetic' language of vectors and matrices as lists and tables of numbers, and the 'structural' language of vector spaces and linear transformations" (ibid. p.209). She evidenced the need to be able to switch flexibly from

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one mode to another, and exposed the difficulties caused for students by a lack of flexibility.

More generally, she had developed analyses of practical and theoretical thinking in mathematics (e.g., Sierpińska, 2005). She showed how complex it is to mobilize this epistemological distinction in empirical analyses, as the practical and theoretical aspects of mathematics are inextricably linked. Her monograph on <u>Understanding in Mathematics</u> (1994) was highly influential on researchers in mathematics education across educational levels – and so was the edited volume (1998) with Jeremy Kilpatrick about our field's search for Identity (Sierpińska & Kilpatrick, 1998).

Anna Sierpińska pursued multiple research directions (and published in a multitude of languages!), always with the same epistemological depth. She will be missed, but there is no doubt that her work will continue to inspire future generations of mathematics didactics researchers!

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