

Science as Systems Learning: Some reflections on the cognitive and communicational aspects of science

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ABSTRACT: This paper undertakes a theoretical investigation of the ‘learning’ aspect of science as opposed to the ‘knowledge’ aspect. The practical background of the paper is in agricultural systems research – an area of science that can be characterised as ‘systemic’ because it is involved in the development of its own subject area, agriculture. And the practical purpose of the theoretical investigation is to contribute to a more adequate understanding of science in such areas, which can form a basis for developing and evaluating systemic research methods, and for determining appropriate criteria of scientific quality. Two main perspectives on science as a learning process are explored: research as the learning process of a cognitive system, and science as a social, communicational system. A simple model of a cognitive system is suggested, which integrates both semiotic and cybernetic aspects, as well as a model of self-reflective learning in research, which entails moving from an inside ‘actor’ stance to an outside ‘observer’ stance, and back. This leads to a view of scientific knowledge as inherently contextual and to the suggestion of reflexive objectivity and relevance as two related key criteria of good science.

KEYWORDS: Agriculture, cognition, communication, experiential, learning, research, science, self-reflective, systemic.

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