

Deductive syllogism questions play a key role in PISA

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The Programme for International Student Assessment (**PISA**) is a worldwide study by OECD in member and non-member nations intended to evaluate educational systems by measuring 15-year-old school pupils' scholastic performance on mathematics, science, and reading. Judith D. Singer et al. showed how to improve PISA (1). PISA and post-normal science (PNS) have been used together for mathematics. Silvio Funtowicz and Jerome R. Ravetz claim that PNS represents a novel approach for the use of science on issues where facts are uncertain, values in dispute, stakes high and decisions urgent (2). PNS shows three stages including applied science, professional consultancy, and post-normal science. Historically we have been in the PNS stage from the beginning and now in science. Conceptually there is no clear boundary in all stages in science. Besides, the progress of science is fundamentally nonlinear and monotonically incremental unless science retractions happen. PISA for young pupils should not be a Ph.D. qualified examination. Uncertain answers against uncertain questions should not be graded. Deductive syllogism questions should be used in PISA.

References:

1. Judith D. Singer et al., Testing international education assessments, *Science* 06 Apr 2018: Vol. 360, Issue 6384, pp. 38-40
2. Funtowicz, S. and Ravetz, J., 1993. "Science for the post-normal age", *Futures*, 31(7): 735-755