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Input variable scaling for statistical modeling.

Bericht des ZUMA Nachrichten

Kurzfassung

The astronomy concepts of 345 young people were studied over a 10-year-period using a multi-media, multi-modal methodology in a research design where survey participants were interviewed three times and control subjects were interviewed twice. The purpose of the research was to search for evidence to clarify competing theories on conceptual coherence versus knowledge-in-pieces, distinguishing between coherence as revealed in the representational systems at any particular stage in a young person's development and the changes evident in mental growth thereafter. Thus five research questions concerned with the elements and structure of understanding were investigated: (a) conceptual coherence shown as patterns of high correlation of concept representations between the media used to assess subjects' understanding within a survey, as well as (b) coherence revealed as consistency of representation of those concepts across media and modalities; (c) enhanced conceptual understanding and skill through repeated interviews across (longitudinal) surveys, as young people develop their knowledge; (d) cultural similarity in subjects' representations of basic static concepts (e.g. the shape of the Earth); and (e) improved understanding of basic dynamic concepts (e.g. the motion of the Earth) and complex dynamic concepts (e.g. seasons and eclipses), through 'knowledge-skill compounding' (c.f. Barsalou, 2003). The research findings supported conceptual coherence and rejected the counter argument of knowledge-in-pieces (at an alpha level of .05). Further research is recommended to replicate current research in cultures other than those of China and New Zealand studied here to confirm the view that cognition and knowledge are inherently coherent in young people.