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Biased Learners for Rational Teachers: Do We Need a Tricky Bounded Teaching?

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Commentary

Following classic studies on the psychology and cognition of learning [1-3], educators designed teaching heuristics adapted to the real skills of their students, from early to advanced ages, or even combining ages in interactive and cooperative active learning by doing [4]. But despite of possible adaptations to the students cognitive horizon that act as a boundary for the possible skills, techniques, and data acquisition, still is maintained a belief into the learner as a rational learner. Despite of the fact that bounded rationality [5,6] has emerged as a more reliable paradigm to approach to real human cognitive processes, this revolution has not reached the educational sphere.

My point here is to remark the necessity of forcing a Copernican turn into the educational researches: a new paradigm in which the learner is not only a human under cognitive construction (from a wide perspective), but also as a failed human affected with plenty of reasoning biases. These biases cannot be solved or surpassed forcing the learners to follow narrow formal reasoning heuristics. Authority bias, self-consistency bias, illusory truth effect, Simpson's paradox, overconfidence effect, or authority bias, among a huge list, are not under the formal competence of any graduate student. This is possible due to two main problems: (1) students are trained as heuristic-followers (with a broad range of possible heuristics, according to the formal richness of the attended schools), and (2) students are considered as rational humans. The later point is easily checked, for example, into schools which combine (restrictive) religious and scientific training, usually under direct conflict; in these contexts teachers are not pushed towards critical thinking but to the acquisition of accepted heuristics, despite of the obvious contradictions present into the courses contents.

There is another big problem: models used in teaching practices, as useful visual metaphors (molecular structures, physical formulae,…) are oversimplifications that capture a reduced set of properties of the real facts under study [7]. Besides, these mechanistic explanations are not trans-systemic, able to be applied from every reality scale to a new one. Some mechanisms useful at atomic level are not useful at all at a social one. The incredible divergence and complexity of our surrounding realities add confusion to the learner who is trying to capture the 'real reality' (the thing-in-itself, a fake concept). This can confuse the learner about the power of sciences, diminished without a true reason.

Finally, there is a great general bias: the high amount of techniques, skills, and data we need to transmit to students force them to accept uncritically the received ideas. I suggest you an easy and surprising experiment: in the middle of any of your courses, try to introduce a false set of data (a technique, a person, a concept, an animal, an object, a model,..) and then wait for the reaction of your students. Surely, it will never arrive, because they do not try to check the received knowledge. They just believe us. This last is the best lesson: we try to make rational the minds of intrinsically irrational beings. This is not a lost game, but a difficult one. Surely, if we do not cheat ourselves about the bounded cognitive nature of the minds of our students, we will teach team how to manage this complexity.

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