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Riddles in VERITASIAM: Making sense of how students reflect

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Reflection

"Reflection enables us to correct distortions in our beliefs and errors in problem-solving" (Mezirow, 1990). The importance of reflection in education has been noted as far back as 1910 in John Dewey's book "How we think". According to Dewey, there are 6 phases of reflection. 1. an experience; 2. spontaneous interpretation of the experience; 3. naming the problem or the question that arises out of the experience; 4. generating possible explanations for the problem or question posed; 5. ramifying the explanations into full-blown hypotheses; 6. experimenting or testing the selected hypothesis. (Rogers, 2002) Reflection is also an integral part of metacognition including self-regulation in learners (Ertmer and Newby, 1996, Bewes and Sharma 2011).

Intervention

Derek Muller of the physics education channel "Veritasium" uploaded two videos, the first of which asked four physics riddles, and the second answered these riddles. These video mirror the stages of reflection outlined by Dewey. These two videos were shown to first year physics students at the University School of Physics. The students watched the first video, and were prompted to write down their answers, and the confidences in their answers. Then they watched the second video, and answered if they did/or did not change their mind, and why. The total sample size was 548 first year physics students.

Categories

The answers were coded qualitatively, and fell into distinct categories, which match Mezirow's (1998) taxonomy of critical reflection.

The categories were "Almost", "Alternative Solution", "Issues", and "Self". "Almost" "Alternative" and "Fault" all match Narrative Critical Reflection On Assumptions (CRA), outlined by Mezirow, and "Self" matches Narrative Critical Self Reflection on Assumptions (CRSA). The question had a profound impact on the types of reflection triggered. The detailed analysis will be presented at the conference.

References:

- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In Handbook of self-regulation (pp. 13-39).
- Mezirow, J. (1990). How critical reflection triggers transformative learning. *Fostering critical reflection in adulthood*, 1, 20.
- Mezirow, J. (1998). On critical reflection. *Adult education quarterly*, 48(3), 185-198.
- Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers college record*, 104(4), 842-866.
- Ertmer, P. A., & Newby, T. J. (1996). The expert learner: Strategic, self-regulated, and reflective. *Instructional science*, 24(1), 1-24.
- Sharma, M. D., & Bewes, J. (2011). Self-monitoring: Confidence, academic achievement and gender differences in physics. *Journal of Learning Design*, 4(3), 1-13.
- Dewey, J., & HMH, H. M. H. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. D. C. Heath, Boston.

Apply to be considered for a student award (Yes / No)?

no

Level for award (Hons, MSc, PhD, N/A)?

n/a

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