Edmonton Abstracts

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Faculty Presentation

Learning Trajectories: Fostering Learning of Introductory Physics via Student Interactions

I analyze introductory physics student learning, interpreting student experiences by analogy as a series of individual trajectories through a multi-dimensional learning space. I model this learning space or envelope as bounded by and consisting of the student’s prior knowledge, the formal curriculum , the textbook, the classroom and laboratory learning environments, and the interactions between students and the instructor. A phenomenon akin to an average student drift velocity resulting in standard paths between conceptual structures within the learning space can be postulated and observed. Strategies for making learning trajectories more explicit to instructors and students by externalizing student thought, interaction and reflection will be discussed. Implications and strategies for classroom instructor preparation and behavior for small and large scale classes will be presented and discussed.

Phjase space vs indepentant operationalized coordinates space

Daily expectation of student discourse and activity

Complex environment, interventions can have progressive and regressive results simultaneously along different dimensions

Gas diffusion vs Drude electron drift velocity, retrograde motion and RMS learning?

Analogy not tautology

Deliberately Reflective practices

Galileo quote and OAPT website

Psychology of expectations, ingroups,

Testing, role of “misconceptions,” expectations for deep learning and the NOS/NOL

Surf the wave

Faculty / teacher presentation

Fostering Learning of Introductory Physics via Intensive Student Discourse: Strategies and Examples

I describe the promotion of student introductory physics learning via extraordinarily high levels of student discourse established using strong expectations, rich multifaceted “touchstone activities’ from Physics Education Research, and managed classroom culture. Examples from both small group and large-scale physics lecture environments will be demonstrated, presented and discussed. Implications for physics teacher preparation will also be presented and discussed.