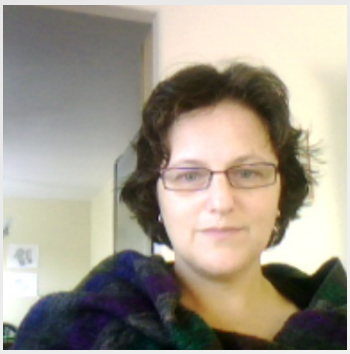
The Michigan State University ***Program in Mathematics Education (PriME)*** and the ***CREATE for STEM Institute*** welcome you to a jointly sponsored colloquium by



SHULAMIT KAPON

THE JAIME AND JOAN CONSTANTINER SCHOOL OF EDUCATION, TEL AVIV UNIVERSITY

WEDNESDAY, MARCH 21, 2012
3:30-5:00 PM
252 ERICKSON

DECONSTRUCTING KNOWLEDGE CONSTRUCTION IN ANALOGICAL REASONING PROCESSES

There is ample evidence that analogical reasoning contributes to the construction of knowledge in students' learning. Nevertheless, the research literature has failed for the most part to deal with the fact that students do not always "buy" these explanations and that individuals differ in their response to analogical explanations. This talk presents findings from a study that follows ongoing reasoning processes prompted by instructional analogies in physics. Determining what individuals know and how this changes as they learn is an important and difficult question that is inextricably linked to one's epistemological perspective. This study is guided by the Knowledge in Pieces (KiP) perspective on conceptual change (diSessa, 1993). KiP is an evolving heuristic framework for describing knowledge in use and in development. An inherent difficulty in the KiP related methodological program is that the researcher has no direct access to the learner's knowledge system. In this presentation I discuss how specific knowledge elements and the dynamics of the knowledge system can be inferred from authentic learning events, and what this in turn can tell us about processes of learning and conceptual change. Building on a bottom-up analysis to explain students' individual responses to instructional analogies, we developed a model of explanation and change in explanation focusing on knowledge elements that provide a sense of satisfaction to those judging the explanation. I will show that by analyzing properties of students' underlying knowledge systems I can explain differences between individuals' responses to similar instructional sequences, and account for processes of knowledge construction that take place as students reason through instructional analogies. I am currently engaged in exploring how the model and principles developed in this study can be appropriated to studying processes of mathematics thinking and learning.

The study is conducted in collaboration with Andrea A. diSessa. The ongoing research project is supported by a Marie Curie International Outgoing Fellowship within the 7th European Community Framework Program.

Bio: Shulamit (Shuly) Kapon is a postdoc at the Department of Mathematics, Science, and Technology in the School of Education at Tel Aviv University. She is a recipient of the Marie Curie International Outgoing Fellowship for Career Development (2009-2012). The outgoing phase of her postdoc (2009-11) was carried out in the Graduate School of Education at the University of California, Berkeley, and the return phase (2011-12) currently at Tel Aviv University. Shuly studies analogical reasoning in science, instructional scientific explanations, and popular scientific explanations. She is interested in how learners make sense of physics, how a sense of understanding is constructed, and designing instruction that supports an active construction of a sense of understanding. Recently she became interested in sense making process in mathematical contexts and started to collaborate with researchers in mathematics education. She holds a Ph.D. in Science Education (2009) from the Weizmann Institute of Science in Israel, and a B.A. and M.Sc. in Physics from the Technion, Israel Institute of Technology. She is an experienced physics teacher (high school, introductory undergraduate level, and in-service teachers) and has been involved in many educational technology innovations in Israel.