

Meeting: 1003, Atlanta, Georgia, MAA CP N1, MAA Session on Teaching Visualization Skills

1003-N1-270 **Walter J. Whiteley*** (whiteley@mathstat.yorku.ca), Department of Mathematics and Statistics, York University, 4700 Keele Street, Toronto, Ontario M3J 1P3, Canada. *Visual and Kinesthetic Reasoning in Mathematics: Current Research*. Preliminary report.

Over the last few years, the strong connections between visual and kinesthetic reasoning in successful practices in mathematics has been confirmed. For many students, their critical breakthrough to understanding occurs in the context of experience with physically or visually supported models. From observed hand gestures, and from cognitive studies reported at ICME 10, we see that both experts and novices process the concepts and 'make sense' out of the ideas through these senses. Some key points from this, for presentation include:

1. 'Scaffolding' with physical objects and conceptually based computer models lays the groundwork for later reasoning in 3-D.
2. The current students are not developing the necessary skills in 3-D reasoning needed for work in other disciplines.
3. It is important that students become aware that: what they see is not what the student beside them sees, or what the teacher sees - and we can change what we see.
4. A major gap in education in visual and kinesthetic reasoning is the development of widely shared conventions as well as support materials to be used over multiple courses to support effective use of visual and kinesthetic reasoning. This is a community task, to which workshops such as this contribute. (Received September 06, 2004)