Learning Engineering:

The Missing Discipline

Dr. Robby Robson is a researcher and innovator in the broad field of learning technology who has contributed to numerous standards and technologies that are widely used today. He is currently leading an open source effort that is defining infrastructure and contributing to standards for managing and sharing competencies and learner records and is involved in several projects that apply recent technological advances in natural language processing and machine learning to improve the efficiency and effectiveness of training systems. Within the IEEE, Dr. Robson serves on multiple boards and committees, including the IEEE Standards Association Standards Board and the IEEE Future Directions Committee, and chairs the subcommittee of the Industry Connections Industry Consortium for Learning Engineering (ICICLE) that is organizing the first international conference on learning engineering. Dr. Robson holds a doctorate in mathematics from Stanford University and is CEO and co-founder of Eduworks Corporation.

Abstract: Nobody ever seems happy with educational and training technology. It often appears clunky and complicated compared to other consumer-oriented technologies and it doesn't feel as though it is doing much to improve outcomes or reduce time to performance. Why is this? One reason is that it is, in fact, complicated. Typical systems at MODSIM World use diverse and sophisticated technologies that require specialized knowledge to piece together. This is hard enough, and to be effective they should also be based on sound learning science and tailored to the training needs they are meant to address. Nonetheless, it is doubtful that this level of complexity is so different from that faced by many other applications of modern technology. What seems to be missing is a critical mass of well-prepared engineers who have have the background and skills needed to work with learning scientists, instructional designers, and training professionals to integrate these technologies into highly usable and effective training systems. Bror Saxberg has termed these *Learning Engineers*, and over the past year several academic programs and cross-industry efforts have sprung up to define and promote the discipline of *Learning Engineering*, including the IEEE Industry Connections Industry Consortium on Learning Engineering ("ICICLE") which has special interest groups (SIGs) working on topics ranging from AI and adaptive technologies to professional curricula and learning experience design. This keynote introduces these efforts, discusses the potential and benefits of creating a modelling and simulation track within Learning Engineering, and outlines what such a track might look like.