

Ohio University
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DISSERTATION ABSTRACT

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**Optimizing Learning in Distributed Education:
A Real-time Interactive Multimedia Communication Interface Experience**

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New information technology is significantly altering the educational delivery system. Distributed education has become an important means of teaching and learning worldwide. Distributed learning provides the opportunity to connect learners at a geographical distance, while also facilitating neighborhood communication systems. Today, although networking technology makes it possible to present interactive communication, not enough has been done to optimize learning in this distributed environment. Distributed education yields learners less satisfied despite outcomes equal to traditional education. When searching for reasons, one potential source lies in exploring learning theories. Finding out the effective learning principles and incorporating them into learning interface design will likely improve the learning experience. This study examines the attributes of distributed learning and current distributed learning formats. It explores how cognitive learning theories can support distributed learning interface design. Seven criteria for designing a distributed learning interface are generated. These include: extensive interaction; flexible structure; multiple resources; transparent interface; learner control; attention; and satisfaction. Finally, an ideal Real-Time Interactive Multimedia Interface (RIMCI) model is constructed based on these criteria. RIMCI not only can strengthen communication processing in a distributed environment, but also enhance learners' information processing ability, correspond with different learning styles, and eventually optimize learning outcomes. A prototype of this interface was implemented in a simulated distributed environment. A curriculum unit was conducted with a group of middle school students to test effect of the prototype. Feedback from the testing was gathered and suggestions for further study are generated.

This study's significance is enhanced because the designed interface is supported by learning theories. The importance of this study is further augmented by its feasibility. It is reasonable to expect that the model may be implemented and effective in today's classroom.