Oral Defense Announcement
University of Missouri – St. Louis Graduate School

An oral examination in defense of the dissertation for the degree
Doctor of Philosophy in Education with an emphasis in Teaching and Learning Processes

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Participation in Sporting Activities
As a Mechanism for Enhancing Science Instruction

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Abstract
After students have taken years of science classes, they still believe science content is disconnected to the “real” world or to their lives. Teaching without attention to relevance results in decreased motivation for learning and negative attitudes toward science. An instructional method incorporating physical, sport-related activities was used to develop relevance and therefore enhance achievement in science as compared to typical/traditional instructional methods. In the typical method, lessons consist of front-loading information through direct instruction followed by a laboratory activity to apply the content of the lesson. In the experimental method, lessons consisted first of active engagement in a sport activity related to the science content, thus front-loading relevance. These activities were followed by typical teaching of the content. Eleventh and twelfth grade students (N=16) attending a suburban Midwest high school participated in both lesson types. A mixed methods case study assessed the benefit of active, sport related design lesson design. Quantitative pre- and post- assessment scores measured concept understanding. Qualitative narratives addressed responses to pre- and post-instruction attitude surveys. Science-based quiz questions were grouped by direct relationship to typical or experimental methodology. Those questions related to typical methodology yielded an increase of 21.8% (± 4.2), while those related to experimental yielded an increase of 39.6% (± 13.9), t (38) = 4.16, p < 0.01. Attitude changes were less dramatic. The population mode response changed in only 52 of the 92 questions between the pre- and post- surveys administrations. It was concluded that the experimental methodology of integrating relevant sport activities: (1) increased learning compared to typical methodology, and (2) led to a moderate positive change in attitudes toward science.

Defense of Dissertation Committee
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