Science Teachers' Understanding and Use of Instructional Strategies Within the 4 x 4 Block Schedule

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Abstract

The primary purpose of this researcher was to investigate how science teachers engage students under the 4 x 4 block schedule and how the teachers' understanding of how they use instructional strategies influenced their lessons. As an inquiry-based approach has been adopted by the National Science Standards, research has suggested that block scheduling provides more time for teachers to incorporate varied strategies such as inquiry-based and cooperative learning teaching which have philosophical roots in a social constructivist philosophy. This research investigated the questions: What instructional strategies do science teachers use to engage students on the 4 x 4 block schedule? How do science teachers understand their use of instructional strategies?

The methodology was qualitative in nature and involved a multiple case study of three high school science teachers at a large rural county high school. Data sources included pre-observation interviews, classroom observations, post-observation interviews, and the collection of documents and artifacts such as lesson plans, student hand-outs, worksheets, laboratory exercises, homework and other document(s) the teacher used to prepare for or implement a lesson.

The evidence observed in this study, suggests that the strategies used by these three science teachers remain mostly didactic in nature. Although the teachers reported in the interview phase of this research that they use a wide variety of strategies, what was

observed within the 4 x 4 block structure was the use of different didactic strategies, not different holistic strategies. Although the teachers were aware of more holistic strategies such as inquiry-based and cooperative learning, they were not adopted nor adapted within the lesson. The three teachers used strategies that were consistent with their scientific realist views concerning the nature of science. These scientific realist philosophies are antithetical to a social constructivist approach to teaching and learning, which is what the National Research Council suggests science teachers adopt.

This dissertation is dedicated to those whom I hold close. First, and with gratitude that is beyond expression, my wife Karin and my two sons, Christian and Casey. You will always inspire me. To my dad, the ultimate educator and mentor. To my mom who supported me and kept me going, to my in-laws John and Lorraine Dunn for helping at every turn, and finally to George N. Porterfield for the time and space to not only try new things within the classroom, but to complete this degree.

I would like to acknowledge the incredible support and help of my two Co-Chairs, Dr. Glasson and Dr. Doolittle. It's appropriate that my defense is on May 1st, "Mayday," a term used by pilots before they crash and burn. You two have been my parachute.

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