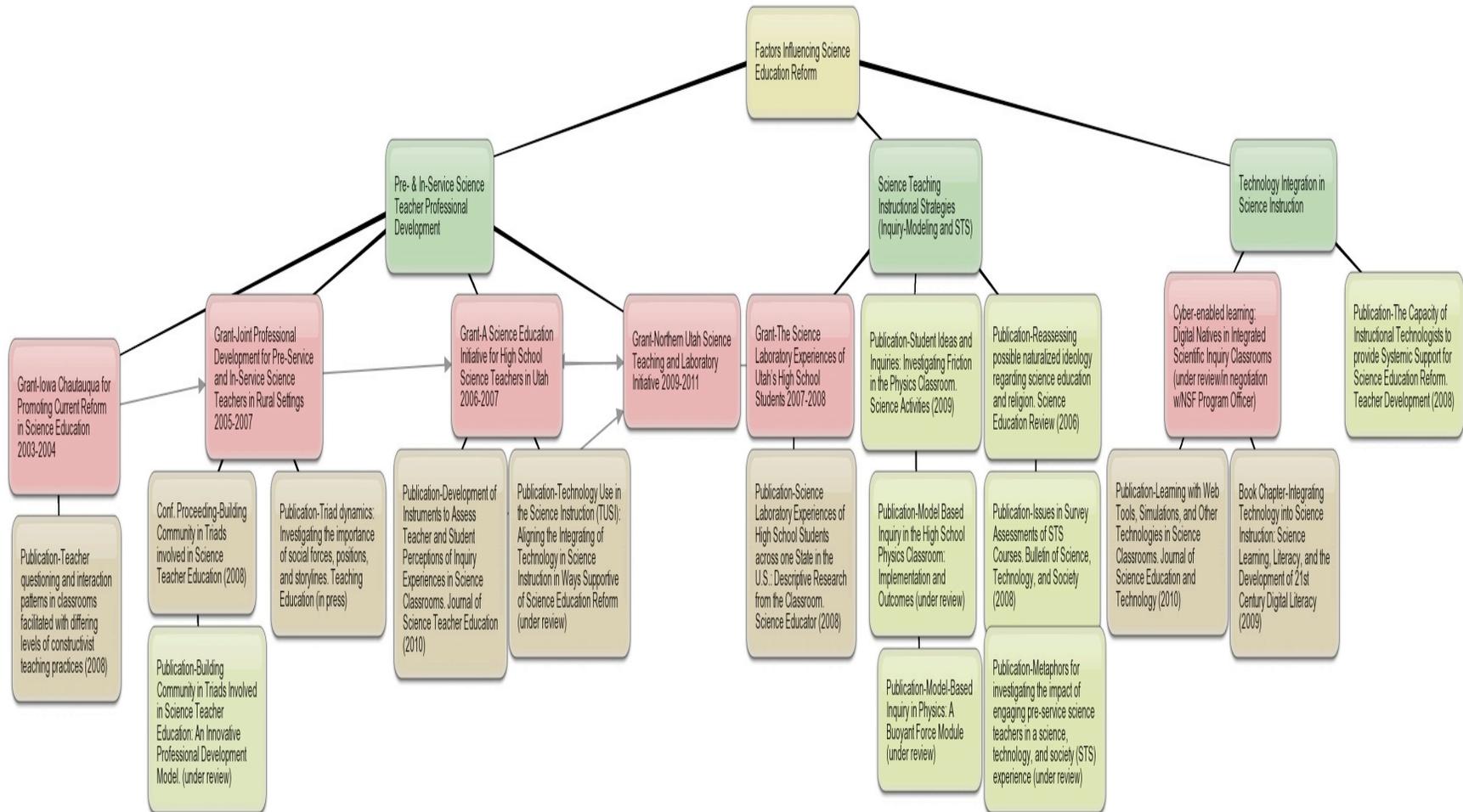


Campbell Research Pathway/Trajectory and Narrative



Narrative: This narrative is intended to articulate the coherency of my research pathway to date, while also providing insight into a future research trajectory.

Factors Influencing Science Education Reform-This is the overarching focus of my research. Through this focus I intend to learn more about what can and should influence changes in science education. The three themes where my work clusters are *Science teacher professional development (pre-service & in-service)*, *Inquiry and Model Based Inquiry*, *Science-Technology-Society (STS)* and *environmental instructional strategies*, and *Technology integration in science instruction*. The following narrative explains the circuitous route that I have taken to build a record of scholarship focused in this area. While opportunities have shaped the research pathway (e.g. grant funding, invitations to collaborate in research), the research focus has always been the central filter through which decisions about whether to pursue opportunities and projects have been made. The pathway of each cluster is explained next. While the clusters are discussed separately, it is important to note that many connections have occurred across these clusters (e.g. the current NSF proposal under review titled *Cyber-enabled learning: Digital Natives in Integrated Scientific Inquiry Classrooms* is a much focused on In-service professional development as it is integrating technology in science instruction).

Science teacher professional development (pre-service & in-service)- Work in this area started in my doctoral work in 2003-2004 at the University of Iowa when I co-wrote and coordinated the project titled *Iowa Chautauqua for Promoting Current Reform in Science Education*. This project led to research and co-authorship of the manuscript titled A look at student action in the science classroom was published in *Science Education International* in 2005. In addition to this manuscript, another article emerged from this research titled Teacher questioning and interaction patterns in classrooms facilitated with differing levels of constructivist teaching practices in the *International Journal of Science Education* in 2008. The 2005 research focused on student actions also led to the recently accepted article titled The Student Action Coding Sheet (SACS): An Instrument for Illuminating the Shifts toward Student-Centered Science Classrooms in the *International Journal of Science Education* that is currently in press. In addition, this initial professional development project also shaped the framework for the funded USU New Faculty grant titled *Joint Professional Development for Pre-Service and In-Service Science Teachers in Rural Settings* from 2005-2007. This grant led to the conference presentation and publication of the manuscript titled Triad dynamics: Investigating the importance of social forces, positions, and storylines in *Teaching Education* that is currently in press. It also led to publication in a conference proceeding and the subsequent submission of the article titled Building Community in Triads Involved in Science Teacher Education: An Innovative Professional Development Model that is currently under review by the *Science Educator*.

In addition to this grant funding, I also received grant funding from the Utah State Office of Education to fund the following grant: *A Science Education Initiative for High School Science Teachers in Utah* (2007-2008). This grant allowed me to work closely with a grant funded consultant and colleague science educator to create two instruments and design the professional development grant project that was funded in 2009 titled the *Northern Utah Science Teaching and Laboratory Initiative*. Of the two instruments that were created from the 2007-2008 grant, one was published titled *Development of Instruments to Assess Teacher and Student Perceptions of Inquiry Experiences in Science Classrooms* in 2010 and the other titled *Technology Use in the Science Instruction (TUSI): Aligning the Integrating of Technology in Science Instruction in Ways Supportive of Science Education Reform* is currently under review. The *Northern Utah Science Teaching and Laboratory Initiative* also shaped the design of the professional development included in the NSF grant proposal titled *Cyber-enabled learning: Digital Natives in Integrated Scientific Inquiry Classrooms* that was submitted in 2010 and is currently under review.

Inquiry and Model Based Inquiry, Science-Technology-Society (STS) and environmental instructional strategies-Investigations in this area have been supported by a Utah State Office of Education (USOE) grant titled *The Science Laboratory Experiences of Utah's High School Students*. This project led to the publication of a USOE report and the publication of the manuscript titled *Science Laboratory Experiences of High School Students across one State in the U.S.: Descriptive Research from the Classroom* in 2008.

In considering the role of inquiry as an instructional strategy in the science classroom, my extensive collaboration with Drew Neilson from Logan High School, a former masters student in the School of Teacher Education and Leadership, has led to the publication of the practitioner article titled *Student Ideas and Inquiries: Investigating Friction in the Physics Classroom* in 2009, and two subsequent submissions that are currently under review, namely *Model Based Inquiry in the High School Physics Classroom: An Exploratory Study of Implementation and Outcomes* and *Model-Based Inquiry in Physics: A Buoyant Force Module*.

I have also completed research investigating Science/Technology/Society (STS) as an instructional strategy in science. In this work, I first published a position statement titled *Reassessing possible naturalized ideology regarding science education and religion* in 2006 and have since 1) collaborated with a faculty member at Clemson University to investigate the impact of undergraduate engagement in STS that led to the publication of *Issues in Survey Assessments of STS Courses* in 2008, and 2) investigated the experiences of my own students in the *Science in Society* course here at USU. This latter work led to the

submission of the research titled *Revisiting Science-Technology-Society by Investigating the Impact of Engaging Pre-Service Science Teachers in a Science in Society Course* that is currently under review.

Technology integration in science instruction-In this area, I initially investigated the role of instructional technologist in supporting science education reform in the 2008 publication titled *The Capacity of Instructional Technologists to provide Systemic Support for Science Education Reform*. I also continued to collaborate with former colleagues from the New York Institute of Technology as we published the book chapter titled *Integrating Technology into Science Instruction: Science Learning, Literacy, and the Development of 21st Century Digital Literacy* in 2010. This continued collaboration led to the Collaborative proposal that was submitted titled *Cyber-enabled learning: Digital Natives in Integrated Scientific Inquiry Classrooms*, which is currently under review. This grant proposal was reshaped as a position paper after submission to NSF and was subsequently published as the article titled *Learning with Web Tools, Simulations, and Other Technologies in Science Classrooms* in 2010.