

## **Public Abstract**

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Title: Alternative Certification Science Teachers' Understanding and Implementation of Inquiry-Based Instruction in Their Beginning Years of Teaching

Reforming science education at any level and phase depends on teachers (Committee on Science and Mathematics Teacher Preparation, 2001). However, alternatively certified beginning science teachers' understanding and use of classroom inquiry has not been studied. I aim to begin to address this gap in the literature through the present study. Understanding the beginning years of teaching will help inform teacher preparation programs, both traditional and alternative. Improved Alternative Teacher Certification Programs (ATCP) will strengthen teachers' knowledge and produce highly-qualified science teachers. So, recognizing common concerns and gaps in understanding classroom inquiry is critical to improving the design and implementation of ATCPs. Understanding alternatively certified beginning science teachers' practice of inquiry in the beginning years of science teaching is thus significant.

The purpose of this phenomenographic study was to: (a) understand how beginning science teachers recruited from various science disciplines and prepared in an ATCP implemented inquiry during their initial years of teaching; (b) describe constraints and needs that these beginning science teachers perceived in implementing inquiry-based science instruction; and (c) understand the relation between what they learned in their ATCP and their practice of teaching science through inquiry. The participants of this study consisted of four ATCP teachers who are in their beginning years of teaching. Semi-structured interviews, classroom observation, field notes, and artifacts used as source of data collection.

The beginning science teachers in this study held incomplete views of inquiry. These views of inquiry did not reflect inquiry as described in NRC (2000) - essential features of inquiry, - nor did they reflect views of faculty members involved in teaching science methods courses. Although the participants described themselves as reform-oriented, there were inconsistencies between their views and practices. Their practice of inquiry did not reflect inquiry either as outlined by essential features of inquiry (NRC, 2000) or inquiry as modeled in activities used in their ATCP. The research participants' perceived constraints and needs in their implementation of inquiry-based activities. Their perceived constraints included logistical and student constraints and school culture. The perceived needs included classroom management, pedagogical skills, practical knowledge, discipline, successful grade-specific models of inquiry, and access to a strong support system. Prior professional work experience, models and activities used in the ATCP, and benefits of inquiry to student learning were the declared factors that facilitated the research participants' practice of inquiry-based teaching.

The findings of this study suggest several implications for science educators who: (a) are involved in teaching science methods courses, (b) design both traditional teacher education and alternative teacher certification programs, and (c) design and implement of professional development programs.