

Capstone Course: A Qualitative View Into Instructor's Role and Teaching Practices

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ABSTRACT

Capstone courses are uniquely positioned in higher education programs. A capstone course in teacher education programs provides an opportunity for preservice teachers to synthesize their undergraduate learning. A capstone course builds and connects a bridge between college learning and workplace environment to ease preservice teachers' transition into the workplace. In this transition process, faculty helps preservice teachers elicit, reflect, and interpret their own understanding of their content area and relate it to their teaching practices. This article draws upon a series of semi-structured interviews with capstone instructors across the United States. It explores the experiences of faculty, teaching capstone courses and provides rich accounts of how capstone courses serve preservice teachers. It offers an insight into the challenges faculty face while teaching capstone courses. The findings provide an overview of mathematics education capstone instructors' pedagogical approach and their belief about the role capstone courses within teacher education programs.

KEYWORDS

Instructional Practices, Instructor Role, Mathematics Capstone, Mathematics Faculty Perspective, Teacher Education

INTRODUCTION

In teacher education, there has been extensive discussion on the best approach in preparing effective teachers for the professional world. Some argue that preservice teachers learn by observing in-service professionals in action. In contrast to the apprenticeship approach, others recommend providing opportunities for preservice teachers to practice and reflect on teaching before starting their career (Brown & Benson, 2005). To address this need, many American teacher education programs have created capstone courses, where preservice teachers are granted with the opportunity to practice and reflect on their teaching practices.

A capstone course in math education programs aims to prepare successful professionals in the field. Among undergraduate courses, capstone courses are the most unique by their nature, objective, and purpose. They are designed to serve as a bridge, facilitating preservice teachers' transition into their first career as in-service teachers. Conference Board of Mathematical Science (CBMS, 2001)

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has emphasized the importance of capstone courses for secondary PSMT not only for the integration of knowledge but also for the development of necessary connections with the university mathematics and high school mathematics. It is important for preservice teachers (PST) to have the opportunity to experience and integrate their content knowledge and pedagogical knowledge to become effective teachers (Hill, Rowan, & Ball, 2005).

During the past few decades, there has been a push for mathematics teacher education programs to provide opportunities for preservice mathematics teachers (PSMT) to make explicit connections between higher level mathematics topic and mathematics that they will be responsible for teaching in high schools (Artzt, Sultan, Curcio, & Gurl, 2011). CBMS (2001, 2012) recommended that institutions provide adequate opportunity for teachers to develop an in-depth understanding of mathematics and its teaching. Yet, there is no consistency on goals, approaches, and assessment of capstone courses offered across the U.S. (Cox et al., 2013). Cox et al., (2013) study of mathematics teacher education programs in the United States has revealed that while capstone courses are not offered consistently across all post-secondary mathematics education programs, many programs value capstone courses and continue to offer the course. Teacher education researchers tend to focus on case-based studies of a single capstone lesson, rather than providing an overview of faculty practices (Gifford, Cannon, Stedman, & Telg, 2011).

The purpose of this study is to understand instructional practices of capstone course instructors within diverse mathematics education programs. The sampling was made to ensure diverse institutional classifications. Through the narratives of instructors, we explored the design and curriculum of the capstone courses practiced in mathematics teacher education programs. The main drive behind this exploratory case study was our discontent with the paucity of research on the topic. Additionally, our goal was to start a deliberation among mathematics teacher educators (MTEs) on the role and position of such courses within mathematics education. To start a discussion, we first need to investigate the existing instructional perspectives, in other words, provide an inside view of how current MTEs view their role as capstone instructors. The primary research questions for this study are:

1. **Role:** How do teacher educators define their role in capstone courses?
2. **Instructions:** What are the capstone faculty's instructional practices?

Conceptual Framework: Capstone Course in Higher Education

There is no collective guideline for what a capstone course should look like. It is highly dependent upon the nature of the institution. Each program designs its capstone course in accordance with the goal and nature of their program. Applied fields of studies such as education, nursing, engineering, and business, often include a practicum where students are provided with the opportunity to apply their knowledge within a real work environment (e.g., Butler & Hardin-Pierce, 2005). In such fields, capstone courses are designed to help students transition from students to professionals.

We conducted a literature review on capstone courses that are offered within undergraduate programs across disciplines. That way, we were able to identify the unique features of teacher education capstone courses. What is common across programs is that capstone courses are characterized as past and future-oriented: 1) an endpoint of the prior learning culminating the previous course works and 2) preparing students for their future careers. The existing literature shows that capstone courses across disciplines include components such as culminating the learning, field experience, and transition to work. We will use these three constructs as a conceptual framework, in order to contextualize the teacher education capstone courses:

1. **Culminating the Program:** A capstone course also referred to as senior seminar, is past-oriented in terms of the content. Instead of learning new concepts, capstone courses provide an opportunity for the students to synthesize and integrate concepts previously learned (Davies, 2007). Therefore, most capstone courses do not have a required textbook or teacher-directed instructions, rather

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