Chapter 5

Supporting Beginning Teachers in STEM Content Areas Through Self-Directed Learning and Micro-Credentials

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ABSTRACT

North Carolina teachers provide an important learning foundation for students. As teacher candidates complete their education requirements and begin working in schools, they are faced with many challenges. This discussion focuses on beginning teachers (BTs), or teachers with less than three years of teaching experience. After leaving their educator preparation programs (EPPs), BTs are required to complete onboarding programs and professional development plans while simultaneously learning to manage their daily workloads, plan and assess lessons, and manage

their classroom. This can feel overwhelming for many BTs and may contribute to an early exit from the teaching profession. According to the North Carolina Department of Public Instruction (NCDPI) BTs in the state are much more likely to leave the classroom as compared to teachers that are not BTs, with the attrition rates for BTs and non BTs reported as 12.71% and 6.80%, respectively (NCDPI, 2023).

INTRODUCTION

North Carolina teachers provide an important learning foundation for students. As teacher candidates complete their education requirements and begin working in schools, they are faced with many challenges. Our discussion focuses on K-12 beginning teachers (BTs), or teachers with less than three years of teaching experience. After leaving their educator preparation programs (EPPs), BTs are required to complete onboarding programs and professional development plans while simultaneously learning to handle their daily workloads, plan and assess lessons, and manage their classroom. This can feel overwhelming for many BTs and may contribute to an early exit from the teaching profession. According to the North Carolina Department of Public Instruction (NCDPI), BTs in the state are much more likely to leave the classroom as compared to teachers who are not BTs, with the attrition rates for BTs and non-BTs reported as 12.71% and 6.80%, respectively (NCDPI, 2023). This rate has remained the same (12.6% in 2023) despite calls to action (Fox et al., 2023) and efforts across the state to support BTs (NCDPI, 2023). With higher attrition rates, the need for additional support for all North Carolina teachers in their first three years is clear. STEM teachers in their first three years face additional challenges (Faulkner & Cook, 2006; McConnell, 2017), which we discuss in the next section. To support BTs, we discuss offering teacher-directed professional learning opportunities (TDPL) through the use of micro-credentials. In this chapter, we share the experiences of a group of K-12 BTs teaching STEM subjects in Western North Carolina as they embark on a self-directed professional learning journey with TDPL and micro-credentials.

REFORM IN PROFESSIONAL LEARNING FOR BEGINNING TEACHERS IN STEM

The need for reform and research in STEM teacher education is a decades-old problem (Cochran-Smith et al., 2005; Darling-Hammond, 2005; Milner-Bolotin, 2018; National Research Council, 1996), with the American Association for the

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