Chapter 16
Clemson University's Teacher Learning Progression Program:
Personalized Advanced Credentials for Teachers

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ABSTRACT

This chapter provides an overview of Clemson University's Teacher Learning Progression program, which offers participating middle school science, technology, engineering, and/or mathematics (STEM) teachers with personalized advanced credentials. In contrast to typical professional development (PD) approaches, this program identifies individualized pathways for PD based on teachers' unique interests and needs and offers PD options through the use of a "recommender system"—a system providing context-specific recommendations to guide teachers toward the identification of preferred PD pathways and content. In this chapter, the authors introduce the program and highlight (1) the data collection and instrumentation needed to make personalized PD recommendations, (2) the recommender system, and (3) the personalized advanced credential options. The authors also discuss lessons learned through initial stages of project implementation and consider future directions for the use of recommender systems to support teacher PD, considering both research and applied implications and settings.

INTRODUCTION

For more than a decade, teacher and continuing education researchers have recognized that conventional, one-size-fits-all approaches to teacher professional development (PD) accomplish little to improve teachers' professional learning (Caddle et al., 2016; Darling-Hammond et al., 2017). Instead, teacher PD is most effective in improving instructional practices and increasing student achievement when it is aligned to both teacher and school needs and when it is collaboratively grounded in inquiry, reflection, and experimentation (Borko & Livingston, 1989).

As a result, teachers and school leaders have been requesting more personalized PD that is not only sensitive to school needs, but also responsive to individual teachers' interests, skills, career stage, and context (Martinez, 2019)—something consistent with adult learning theory (Trotter, 2006). Until recently, the technological capacity to both design and deliver meaningful, truly personalized PD has been lacking. Ongoing advances in computational techniques associated with recommender systems (Resnick & Varian, 1997), together with expanded but focused learning opportunities, have made personalized PD for teachers a possibility.

Recommender systems are technologies that provide context-specific recommendations to guide users toward the discovery of preferred content or options (Lu et al., 2015). Their utility and versatility have made them popular and essential tools in a variety of environments, including e-commerce and online media (e.g., Netflix, Amazon, YouTube). While the teaching profession and its PD context are different from e-commerce and online media contexts, the technology used in those settings is nonetheless transferrable and can be used to support the identification of personalized recommendations for advanced credentialing based on teachers' interests and needs. Through the project described in this chapter, researchers are developing a hybrid recommendation system that combines an "interests and skills"-based algorithm with a "needs"-based algorithm in order to individualize PD for teachers—to create *personalized advanced credentials for teachers* that meet their unique PD needs.

This chapter provides an overview of Clemson University's Teacher Learning Progression (CU-TLP) program, recently launched with funding support received through the U.S. Department of Education's Supporting Effective Educator Development grant program. CU-TLP provides middle school teachers of science, technology, engineering, and/or mathematics (STEM) with personalized advanced credentials along three graduate credit pathways: (1) Master of Education (M.Ed.) in Teaching and Learning (which has four specialization options); (2) endorsement (which has three options); and/or (3) micro-credentials (which has 21 options across seven topic areas).

The CU-TLP program focuses on supporting teachers by collaboratively uniting STEM teachers and school leaders—especially those working in high-needs, high-poverty schools—with researchers, computer scientists, and PD facilitators in a supportive, technology-enabled system designed to foster personalized professional learning and growth. This approach moves away from the common, one-size-fits-all teacher PD in favor of a more personalized PD system that identifies and delivers recommended PD pathways for teachers based on the needs, interests, abilities, and contexts of teachers and their schools—instead of the common approach of pursuing global PD topics for all teachers within a school over the course of a given year. Through the development and use of a recommender system, CU-TLP provides personalized PD by gathering and analyzing large amounts of data (e.g., student achievement, teacher performance, teacher and school needs) to suggest automated analytical decision-making aid (Fok & Ip, 2006), helping teachers identify the most meaningful PD pathway for them.

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