Abstract: There have been ongoing national efforts to understand and improve STEM education at colleges and universities. These activities are underscored by the fact that colleges are becoming increasingly diverse, yet underrepresented minority (URM) students still have some of the highest attrition rates in STEM. In light of these issues, my work asks: Can we empower diverse students to succeed in STEM courses by focusing on effective study strategies? And how can we take advantage of learning analytics to gain insights about their study behaviors? Work in cognitive science has demonstrated the importance of two strategies for learning: spacing (splitting up study sessions across multiple days) and self-testing. While these strategies may hold promise for improving student learning outcomes, we don’t fully understand the extent to which students use these strategies in STEM courses, whether students can learn to use them better, or whether improved use of these strategies help address achievement disparities. For my talk, I will share the results of two empirical studies conducted in a large gateway biology course. The first study documents the various strategies students utilize when studying. In addition, this study examines the impact of a light-touch intervention focused on encouraging spacing and self-testing. I also consider whether these strategies uniquely benefit underrepresented students. The second study incorporates learning analytic techniques to uncover how students’ self-reported study strategies correspond to their behaviors within the course’s learning management system. I will conclude my talk by discussing the implications of my work for improving STEM achievement in higher education.

Bio: As a postdoctoral scholar at the University of California, Fernando Rodriguez studies how cognitive theories can be leveraged to improve how students learn information and think critically about evidence. He primarily focuses on college students in technology-enhanced and online courses, and additionally considers how instructors can support underrepresented student success in STEM disciplines. His work also incorporates data science and learning analytic techniques to gain important insights about students’ behaviors in online course settings. Rodriguez received his doctorate in Educational Psychology from the University of Michigan, Ann Arbor. Prior to his time at UC Irvine, he spent three years at WestEd, a non-profit research firm, where he helped schools and districts make data-driven decisions that improved learning outcomes.