# Chapter 3
# STEM Learning Communities:
## An Interdisciplinary Approach to Teaching and Learning

**Bernadette Kelley**
*Florida A&M University, USA*

**Lisa McClelland**
*Florida A&M University, USA*

## EXECUTIVE SUMMARY

*This chapter presents a case study involving the fictional Coastal University's move to the next level of Science, Technology, Engineering, and Mathematics (STEM) student achievement by applying a holistic approach to educating the STEM student using a learning community. Learning communities are designed to improve retention rates, increase student learning and achievement, increase faculty engagement, and lessen the feelings of isolation some students feel on large campuses. This case discusses the various components that were utilized to enhance the learning community including cluster courses, seminars, branch activities, academic progress assessments, and meetings. The challenges with the implementation of the learning community and the engagement in interdisciplinary activities will be discussed as will recommendations for the future.*

DOI: 10.4018/978-1-4666-2214-2.ch003

## INTRODUCTION

"It is a critical national priority to develop, recruit, and retain talent in science and engineering to maintain U.S. economic competitiveness in the context of rapid globalization" (Hurtado, et al., 2011, p. 533). In response to the United States workforce needs in technology and science, Coastal University (CoU) developed a project promoting interdisciplinary learning through a Science, Technology, Engineering, Mathematics Learning Community (STEM LC). This learning community brings together students and faculty from different disciplines within STEM fields to work together on research projects and collaborate on various activities. The STEM LC is designed to improve the overall quality of STEM education at CoU by increasing the university's efficiency in producing quality students. STEM LC is focusing on improving retention rates, increasing student learning and achievement, increasing faculty engagement and decreasing feelings of isolation that some STEM students may experience. In order to achieve these goals, STEM LC has created multidisciplinary partnerships with our STEM LC students, STEM graduate students, and STEM faculty. Members of our learning community establish relationships, participate in joint activities, and use shared resources to accomplish our goals. Student participants are expected to actively engage in program sponsored activities. Those activities include but are not limited to the following: monthly Town Hall meetings, Branch Activity meetings, program surveys, focus group discussions, and the completion of the Learning and Study Strategies Inventory (LASSI). The objectives of this case are to 1) investigate the benefits of learning communities for STEM students, 2) identify the role of the stakeholders for successful STEM programs, and 3) investigate interdisciplinary learning strategies for faculty and students.

## BACKGROUND

Science and technology are important factors for the economic growth and national security in the United States (Li, Swaminathan, & Jiong, 2009). If America is to be competitive with other countries, there needs to be an increase in the number of individuals that graduate from college with a focus in the STEM fields. Coastal University (CoU) realizes the need to address this issue. CoU is a predominantly African American university with a total enrollment of almost 10,000 students. To help address critical workforce needs in STEM, a major mission at the University is the aggressive recruitment of talented students and the cultivation of students from underrepresented groups who demonstrate an interest and commitment to a career in engineering, mathematics, or the sciences. African Americans continue to be underrepresented among degree recipients in STEM fields (Perna, et al., 2009). Students