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Nationally, more than half of all college students who declare a major in STEM fields drop out or change their majors in the first two years of post-secondary education. Among first-generation college students in West Virginia this number may approach 70%. The First2 STEM Success Network, an NSF INCLUDES Alliance, is a cross-sector effort aimed at improving the college enrollment rate and success of undergraduate STEM students, with emphasis on rural first-generation students in West Virginia. At the core of our shared vision is the inclusion of students themselves as co-creators of the solutions. First2 is an outgrowth of a two-year pilot project funded by the National Science Foundation in 2016. During the pilot, we began to create and test interventions that address the underlying reasons for attrition in STEM majors, and to develop a preliminary research program to better understand rural first-generation STEM students, a population for which there is scant existing research. We engaged 36 rural first-generation students in some combination of early STEM research experiences, an online discovery-based "principles of research and development" college seminar, a "hometown ambassador" program, and leadership training. We also developed and administered an online survey to an additional 101 first generation students attending West Virginia University and Fairmont State University. This presentation describes the research and evaluation findings from the pilot project and implications for the Network moving forward. The First2 Network Design and Development Pilot Project was supported by National Science Foundation INCLUDES Award No. 1649323.