We discuss a variety of linked summer professional development courses improving the mathematical content knowledge of elementary and middle school teachers. Supported by a variety of grants, these 2 week courses cover core topics in algebraic processes with geometric connections, geometric structures and several bridging topics. In addition, a central part of this program are academic year opportunities including enrichment content seminars, workshops to discuss issues about mathematics knowledge for teaching and teaching opportunities for innovative enrichment materials. The program developed a cadre of teacher leaders who participated in creative programs for grades 4-6 female students at their own schools. We will discuss the success of these student programs and new possibilities based on these approaches. (Received August 28, 2007)